# PERSONNEL

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# AN EXPERIMENT IN GROUP TRAINING FOR PROSPECTIVE FOREMEN

By LYLE R. MERCER
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**Who are the best prospects among rank-and-file workers for foremanship training? How can the best candidates be found? The Aluminum Company of America when faced with these questions decided to try an experiment. It would give tests to those interested in taking supervisory training. What happened? The results are told in this paper which was presented before the 15th Rutgers Industrial Relations Conference.**

THE primary objective of the experiment described here was to train a group of workmen in the problems of industrial foremanship. This was accomplished by offering a course in Leadership Training to a carefully selected group of workers.

The experimental program used was devised by the Extension Division of the Pennsylvania State College and presented to the company for a trial. The company, being interested in this type of training, agreed to include it as part of its training program, and together with the college planned the experiment in such a way as to best suit the local situation.

Although it was not the purpose of the program to select foremen, we did intend to better qualify for foremanship some of the individuals selected for the training course, and to give them the opportunity to exercise their initiative in obtaining supervisory jobs.

Since the course was planned and taught in such a manner that it would give the individuals who took it a clear picture of the relationship between workman and foreman, it was assumed that the course would be of value even though the individual never qualified as a supervisor.

Our ultimate objective, of course, is to select and train a group of workers in such a way that they will be qualified to assume supervisory responsibilities. The fulfilment of such an objective, however, necessarily will entail a long-range training program.

This experiment is merely the first, although the most important, step toward the realization of that objective.

## PROCESS OF SELECTION

After the experiment had been carefully planned, the first thing to be done, naturally, was to select those persons to whom the training was to be given. Since our primary objective was to train a group of workers in the problems of foremanship, the selection procedure was planned in such a way that we would select men who would profit most from the type of course to

be given. It was assumed that possession of some of the qualities necessary to meet this qualification would also make them better foremen. The selection was made entirely by the use of psychological tests.

The company posted notices in every department announcing the proposed course in Leadership Training, and stating that any male employee could make application for the selective tests, the selection to be made entirely by the Pennsylvania State College and solely on the basis of the test scores made. The notices further stated that anyone interested could make application by obtaining a blank from his division superintendent.

When individuals applied, they were given a written description of the course and additional details concerning the method of selection to be used. It was definitely stated in these written instructions that those selected would be given no guarantee of obtaining a supervisory job, although we did say that the course should enable those who took it to better qualify themselves for supervisory positions if and when opportunities arose.

**TESTS USED**

Four tests were used in the selection:

1. The Otis Higher Form A, a test of mental ability, or, as it is commonly called, an intelligence test.

2. The Minnesota Paper Form Boards, a test for mechanical aptitude.

3. The Bernreuter Personality Inventory (scored for neurotic tendencies), a test of emotional stability.

4. Strong Vocational Interest, scored for production manager. This particular test compares the likes and dislikes of an individual for different activities, types of people, kinds of work, etc., with the likes and dislikes of successful production managers for the same things.

We do not know just what degree of proficiency in the factors revealed in these tests must be attained by a man in order to qualify him as a good foreman. We are inclined to believe that the relationship of the factors in a total pattern is more important than the presence or absence of any one factor. However, in picking men for foremanship training, we may assume that those who possess to a relatively high degree the factors covered in these tests will be more easily trained and—other factors as yet unnamed or unmeasured being equal—will in most cases be better foremen than those not qualified in these factors. Therefore, we selected only those who had comparatively high scores on all tests.

Of approximately 4,000 male employees, 337 applied for the tests. The age distribution of the 337 who applied for the test was:

| Age | No. Applicants | % |
|---|---|---|
| 21—29 | 208 | 61.7 |
| 30—39 | 107 | 31.8 |
| 40—51 | 22 | 6.5 |

We believe that several factors decreased the number of applicants and, at the same time, acted as a pre-selection of those who did apply. These factors were:

1. Pre-selection, by means of a rigid apprentice selection, and training program for skilled workers.
2. Supervisory encouragement of only qualified men.
3. The fear of examination.
4. The fee which was charged for the administration of the tests.

Had the company paid for the tests, it is believed that several hundred more would have applied out of pure curiosity.

#### PLACEMENT TEST GIVEN BY COLLEGE REPRESENTATIVES

The tests were administered in the company classrooms by two representatives of the college. The one for mental ability was administered first and was used as a placement test. The 200 applicants making the highest score were notified that they were eligible to take the other three. It would have been possible to give the four tests to all applicants, but it was thought advisable, since a fee was being charged, to save part of the fee for those who failed the mental ability test and to save the college the trouble of administering the extra tests in cases where it was not necessary.

All applicants were given to understand that they would be notified if they were selected for the course, and were also told that they could obtain their test scores upon request, in person, to the college representatives. All scores were considered as strictly confidential.

It was very evident, from the results of the mental ability and mechanical aptitude tests, that a high degree of pre-selection had taken place. Seventy per cent ranked above the 50 percentile score on the mental ability test, and 94 per cent ranked above the 50 percentile score on the mechanical aptitude test. The scores on the other two tests showed an approximately normal distribution.

Minimum limits were set for each test and no person was to be selected who made a score on any one of them which was lower than these limits. These minimum scores were:

| | |
|---|---|
| Mental Ability | 57 percentile |
| Mechanical Aptitude | 50 " |
| Emotional Stability | 59 " |
| Vocational Interest | B rating for production managers |

Of the 200 applicants who took all the tests, there were 97 with no score lower than these limits on any test. From these 97 we picked the 77 men who had the highest total score on the basis of a regression weighting for each test. It had originally been our intention to select only 75 men, but

the total scores of the last three men were the same. The age distribution of the 77 men accepted for the course follows:

| Age | No. Passed | % |
|---|---|---|
| 21–29 | 55 | 71.4 |
| 30–39 | 20 | 26.0 |
| 40–51 | 2 | 2.6 |

### WEIGHTING OF TEST FACTORS

The intelligence factor was most heavily weighted for two reasons. First, it may be assumed that a man of high intelligence will make a more satisfactory supervisor than one of lower intelligence providing other factors are within equal or acceptable limits. Second, since we were selecting individuals to be trained in industrial leadership, we were interested in having men of high intelligence in order that the training could be readily absorbed. This test received a weight of 40 points out of a total of 100.

The test for emotional stability received a weight of 30 points. Those who are familiar with the problems which the modern industrial foreman faces from day to day will agree, no doubt, that control of the emotions is a very important requisite of good foremanship.

Mechanical aptitude should be of value to the foreman because of the nature of the work which he usually supervises. Proper use of tools and equipment is one of the major responsibilities of the present-day foreman. This test received a weight of 20 points.

The scores of the vocational interest test were given the least weight. We feel that the validity of the norms for this test when scored for production managers were not established well enough to justify giving this test a weight of more than 10 points. Furthermore, it would appear reasonable to assume that a man could have an interest in the same things as supervisors and yet lack other qualities of supervision.

### INTERVIEWS OMITTED FROM SELECTION PROCEDURE

Preliminary interviews for the purpose of selection were not included, although we feel that the majority of those who were later found lacking in certain factors not revealed by the test would have been eliminated thereby. The reasons for not including interviews as part of the selection procedure were:

1. The selection would have been based too much on subjective opinions and would have created ill feeling and dissatisfaction on the part of some who were rejected.

2. Such a procedure would have consumed too much time. Interviews, in order to be effective, would have had to be at least 20 minutes long.

3. The procedure would have been too costly.

The 77 selected men were called in for a group interview at which

they were told the requirements of the course. Two facts were heavily emphasized: first, that there was no guarantee that those who took the course would ever become supervisors; and second, if they expected to remain in the course there would be considerable work for them to do outside of class. It was pointed out that half of the cost of the course would be borne by the men, the other half to be paid by the company. This practice is observed in practically all of our foremanship training courses, since our experience has proved that the individual takes more interest in the training classes in which he has a personal stake.

Two men resigned from the class, one because of a heavy night schedule at a local university and the other because he had lost interest. To facilitate discussion the 75 remaining men were divided into three groups of 25 men each.

#### OUTLINE OF COURSE

The course, which was presented on a lecture discussion basis, consisted of 12 meetings, two hours in length, held once a week. It was outlined, prepared and taught jointly by a professor of industrial engineering and a professor of industrial psychology—both with considerable experience in industrial extension services. Each instructor was responsible for a definite number of meetings on the topics most closely related to his field, but both shared in the discussions.

The discussion topics covered the major responsibilities of foremanship and of worker-foreman relationship, from organization setup through job analysis and specification to the human relations problem in industry.

Each student was responsible for a written project, outside reading, and notes on each of the 12 discussion topics. Four examinations were given on the course material. Each student was privately interviewed by the instructors, separately, as often as he wished to come, or as the instructor thought necessary. Three men had to be called in, but many had to be discouraged from coming too often.

#### HOW THE MEN WERE RANKED

At the end of the course the instructors separately ranked the men on the basis of judgment of their qualifications as potential leaders. The coefficient of correlation between the two rankings was quite high. In those cases where there was considerable difference in the instructors' rankings, the individuals concerned were called in for joint interviews with both instructors. On the basis of the information thus obtained, the instructors were able to establish a composite ranking of the entire group.

A final ranking was made on the basis of several factors, including the instructors' composite ranking, scores made on examinations, grades on

projects, outside reading and notebooks, and the selective test scores.

The supervisors of 36 men picked at random were interviewed near the end of the course in order to get a ranking of the 36 men. There was a close agreement between the supervisors' rankings and the final rank of the men in the course.

It would appear from this that the local supervisors without tests could pick out candidates for training as accurately as such candidates could be selected with the use of such devices. However, this is not the case, for in 16 cases of the 36 they had never thought of the men as possible supervisors, and only in nine cases had they in any definite way been observing the men for possible leadership qualities. It was only after the men had been selected for the training course that the supervisors began to pay close attention to them.

#### GROUP'S REACTION TO TRAINING CLASS

In order to find out what the group thought of the training class, at the end of the course the 75 men were given a questionnaire, which was answered anonymously. The results of the questionnaire showed an almost unanimous opinion that:

1. The course was valuable in training leaders.
2. The course was valuable to the worker who does not aspire to leadership.
3. Thinking in important areas was stimulated.
4. A more advanced course should be offered.
5. The men would be willing to pay for such a course.
6. Most of the material discussed was valuable.
7. The human relations problems were most important.
8. The course was too short.
9. The personal interviews with the instructors were valuable and should be included in any advanced course.
10. All workmen should be permitted to take a similar course adjusted to their level of ability to understand instruction.

Each man was privately apprised of all grades he had made during the course, of his final rank in the group, and of the fact that his complete record had been filed in the office of the personnel department.

No one was qualified on an absolute standard—we don't know of any yet devised. No one was disqualified; the men were merely ranked in comparative order.

The reactions of the individuals to their final ranking was much better than was expected. Not a single complaint came from the top 20 or the bottom 15. Only three in the middle range raised any serious objection, and all of these were cases where, by comparing rankings with others,

the individual thought he should be placed above some other specific person. The general comment was to the effect that a very fair job had been done in an extremely difficult situation.

### RESULTS OF THE PROGRAM

The results of our experiment cannot, as yet, be definitely established. Although the program just described was one of selection and training, we are inclined to view the entire procedure thus far as primarily one of selection. The final results can only be measured by the future effectiveness of our supervisory personnel, and this can only be established after a period of years. We do feel, however, that out of the 75 men, we have a nucleus from which we can select some of our future foremen.

Eight men from this group have already been placed in supervisory positions. We have ample reason to believe that their qualifications as supervisors were greatly increased by the training which they had received. Many others of the group have shown increased effectiveness on the job.

It is not intended, however, that all future supervisors will be chosen necessarily from this group or others of its kind. There have been two cases with which I am familiar where men who applied for the course and failed the tests have since been made foremen. One of these men in particular is doing an excellent job.

### FURTHER TRAINING PLANNED

Forty men from the group of 75 will be given further training. This training will be planned step by step as it is carried out, and will be designed to fit our specific needs, whatever they may be. The other 35 have been dropped for various reasons, some because they are not interested in supervisory work, others because we do not believe they have the necessary personal qualifications. Some were dropped simply because there was little prospect of opportunity for them to assume supervisory responsibilities. We do not want to retain more men in the group than we feel we can use. The 40 men now retained are those who are definitely being considered as good prospects for foremanship by their own superintendents, or those who we feel have such good qualifications that they should be retained as prospective foremen for departments other than those in which they are now employed.

As a result of our experiment we have come to the conclusion that a carefully planned method of selection and training should be used to select and train men far in advance of the time that it becomes necessary to place them in supervisory positions.

Industry has long recognized the need of a two- to four-year apprenticeship course to train men for skilled mechanical trades. Is it not more neces-

sary to recognize the need for advanced selection and training of those men who are to be the leaders in our industrial shops?

In-service foremen training is necessary to good supervision and should be continued, but it would seem highly desirable that more effort be made by industry to pre-select and pre-train its supervisory personnel. Not only should such an effort be rewarded by the increased effectiveness of its foremen, but it should make easier the task of training its in-service foremen in the future.

# PSYCHOLOGICAL FINDINGS AND DEFENSE PRODUCTION

By WALLACE H. WULFECK
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**Under the strain of expanded industrial activity created by defense production, efficient use of the human factor in industry assumes added importance. Both industry and private research agencies have discovered vital facts about such questions as: How can worker fatigue be minimized? How long should the work period be? How can worker skills be discovered and best utilized? How should the workplace be lighted and ventilated? In this article Dr. Wulfeck reviews the findings in these fields and discusses the importance now of applying them.**

EMERGENCY mobilization of industry is at hand. As a prerequisite measure to the nation's program for total defense it has provided the long awaited stimulus to our lagging industrial productivity. The sudden resurgence of life should lead to a new productive vitality, but it will not necessarily do so. There is always the hazard that industry may become so enthusiastic in its efforts to "deliver" that it will forget some of the fundamental lessons learned during its period of relative leisure. There is a real danger that it may be stampeded into a headlong neglect of the demonstrated principles of efficient production.

There is great danger that, under pressure, the achievements of industrial research at the human level—accurate knowledge of "the manpower function"—may succumb to the influence of the old myths: hangover from the days when the way to get things done was to work hard 12 hours a day, 6 days a week. But to abandon what we now know may lead to early frustration and confusion. Industrial methods of production

no longer follow the patterns that Frederick W. Taylor first came to grips with. Science has changed all that. Nevertheless, the old formula is so simple and so "realistic" that its appeal is almost irresistible.

Much of industry's progress has been accomplished through increasing the productivity of men, and it is in this area that its greatest setback can come. Confronted with the "big push," intelligence is faced with the necessity of fighting to make itself heard above the noise of marching feet. Perhaps that puts the idea a little too strongly, but it serves well the purpose of emphasizing the threat so close upon us. This is no polemic in favor of the findings of psychological research but merely a reminder that our production problems can be solved only through the immediate and intelligent application of known scientific principles.

In a time when *volume* production is a hard-ridden political and journalistic theme, management knows, realistically enough, that quantity production alone is senseless. It must be accompanied by that delicate series of productive coordinations which ultimately turns out a maximum number of *perfect or near perfect* units. Units that will deliver a performance as good as, or better than, expected. Quality is important. In the long run it is more important that specifications of performance be met than specifications of design, although the former depend upon the latter.

## LIMITS IN "HUMAN MACHINES"

The coordinations which make productive efficiency possible reside in the capacities and skills of individuals. "The human machines"—labor, management, superintendents and technicians—who produce the tools for defense have known tolerances and limits which must be taken into account. These tolerances are both physical and psychological.

Psychologists and industrial engineers working in industry have found, through research, many ways to measure the tolerances and conserve the man power, while at the same time utilizing its capacities to the point of optimum effectiveness.

A program of research is not here proposed. The need at the moment is rather for application of knowledge previously gained than for new researches. The beginning of our industrial step-up seems the appropriate time to bring together in one simple, understandable statement some of the major results of research on the human element in industry: this as an aid to the furtherance of the national defense program so utterly dependent upon industry's ability to outproduce the factories of the potential enemies of the nation, singly or allied.

This article therefore undertakes to summarize the findings of psychological investigation in industry which ought to be applied. It suggests

some considerations of the means by which increased output may be attained.

## SELECTION AND PLACEMENT

Of late the newspapers, magazines and radio have been frantically reporting a shortage of skilled mechanical workers. Government agencies are hurriedly organizing training programs for machinists, toolmakers and other highly skilled workers in the mechanical trades, in the hope that a real or imagined shortage may be overcome quickly. Recruiting and the selection of men for the training appears to be based upon the principle of "first come, first served." In the light of what is known about aptitudes and abilities such unconsidered selection is potentially extravagant. Industry and the country cannot afford to use this method or the trainees who "graduate" from such schools. Turnover is expensive in normal times. It is disastrous in critical times. Unfitness of the worker for his job is unquestionably the major cause. A partial solution to the problem of turnover lies in the utilization of proved selection techniques. Pick men who have the capacity to perform on the job.

At the very outset it must be pointed out that methods of employee selection are admittedly unrefined in many fields. If they can do no more—and in many types of jobs they certainly can—than rough-screen the candidates on the basis of aptitude, they have gone a long way toward cutting costs and eliminating waste due to rapid turnover, accident and failure to learn basic operations.

On the matter of temperament and disposition alone, men can be picked who have the necessary personality organization to withstand the ravages of repetitive, monotonous operations. Such selection is basic, even before the aptitude factor enters.

The present need of trained mechanics is one field in which psychological or performance testing has gone far beyond the rough-screening stage. The work of O'Rourke, Bingham, Hull, Bennett and Schultz has placed in our hands tools (tests) which determine not only basic mechanical aptitude but which are discriminating for many specific operations and skills. Many industries have made continuous use of such instruments as a part of their routine employment procedure. Of late many of the rapidly expanding airplane manufacturing concerns and related mechanical specialty organizations have initiated aptitude and skill testing programs in order to speed up and improve their worker selection. This is especially true where mechanical apprentices are necessary for supplementing the limited supply of highly skilled toolmakers and machinists. The U. S. Army has started to develop a psychological staff of considerable magnitude in order to carefully test draftees for special mechanical apti-

tudes and abilities. A fundamental step in the development of a highly mechanized army.

It is now possible to obtain for each employee dependable measures of his basic abilities, knowledge, special skills, interests, unusual talents and personality organization. Not all of these facts need be known about every man, but some of them should be known about all employees and all of them about certain promising men. Combining these measures with careful job analyses brings together the right man and the right job.

The use of psychological tests in the selection of employees can be, and in some instances in the past has been, an expensive and useless process simply because the acquisition of accurate knowledge about men is valueless unless it is related to a program of job analysis. It has been at this point that the selection program in numerous industries has broken down. Accurate information about the abilities and skills of a worker is sterile knowledge unless industry knows what to do with such information. At the moment our primary concern is the mobilization of men for increased production. Schultz has pointed out that even in a national emergency "the social security program, unemployment insurance, and similar industrial relations or welfare programs make the problem of human organization in business one that goes far beyond merely getting work done."

Programs for employee selection are useful expedients in times of pressure, but they are infinitely more useful in developing a long-time stable organization. Not only does this kind of information make possible an adequate placement program but it also provides the data on which reassignments and promotions can be based. Moreover, it indicates those men in the organization who can be singled out for special training and development toward positions of increasing responsibility and supervision within the organization.

In recent times a criticism which has been leveled at the use of selection techniques implies that these methods slow down productive progress and that industry cannot wait until the psychologist does this job. Such a criticism can only come from a lack of knowledge of the modern developments in this field and a shortsighted view of effective production techniques.

The past 10 years of psychological experiment with these measuring devices has not only increased their reliability but has reduced to a minimum the necessary time for administration and interpretation. What was once a task of many hours of testing has now been reduced to such a point that in most industries, and for most jobs, a reliable selection process can be accomplished in an hour or less beyond the initial interview.

Working a selection program is no longer expensive, and in recent years the universities have trained many young men capable of administer-

ing personnel selection programs. The best time to study workers is when they apply for a job. To pick the right man for a job serves the man best, reduces chances of turnover, and steps up production.

The most notable and recent example of the acceptance of this principle is to be found incorporated in the pilot training program of the Civil Aeronautics Authority. Faced with the job of selecting thousands of young people for training in the air, it became evident that some scientifically accurate method was needed to aid in choosing from among many candidates only those persons possessing the basic aptitudes and abilities known to be essential for flying a plane. Trial and error is both dangerous and expensive in human life, time and money. To solve the problem a notable committee of psychologists was set to work to find a method through exhaustive research.

The U. S. Navy, also, has a corps of research psychologists attacking these problems. Many American industries will do well to follow suit.

## OUTPUT AND FATIGUE

***Hours of Work.*** One of the easiest assumptions to make, when more and more output is demanded, is that if one unit of work can be done in one hour, then six can be done in six, ten in ten, twelve in twelve and so on. With this kind of simple arithmetic, output is limited only by the number of man-hours in the day. The fact is that it just won't work that way. The human machine is not that mechanical. Multiple factors of fatigue, monotony, incentive, interests and accidents, often operate to disrupt the efficient functioning of men.

### OPTIMUM WORK PERIOD

It is common scientific knowledge that there is an optimum work period during which human production reaches its maximum. Both under and over the optimum work period production falls off. The problem is to find the *best length* of working day or week. Practical experimentation has solved the problem for some industries and can solve it for others, but there is no general law which will apply to all workers regardless of the job they perform. Operations differ greatly, and it is dangerous to predict an optimum working day without an analysis of the work itself.

In the leather industry it has been demonstrated that production reaches a maximum at approximately 40 hours a week and tends to decrease with an increase in the length of working week beyond that point. Similarly, in a plant manufacturing boxes, it was established by an experiment running for 61 weeks that 40 hours per week was the most productive work period. In general it has been learned that the average optimal

working week is somewhere between 33 and 48 hours. The exact location of the daily and weekly optimum is dependent upon the factors which are peculiar to specific operations or industry.

The most exhaustive attempt to study this problem in detail grew out of the mistakes which British industry made during the war years, 1914-18. The Industrial Health Research Board in England conducted an exhaustive research among munition workers. The Board recently reissued some of its findings in the form of a warning to British industry in the present crisis. Tragically enough, we read news of continuous increases in workers' hours in order to rush production, in face of the known fact that it can't be done that way for long. Since the report expresses the Board's findings in an emphatic way, it seems wise to quote from it here. The following is a concrete example of their results: [1]

> Reduction from 58.2 to 51.2 in the actual weekly working hours of a group of fifty-six men, engaged in the heavy labour of sizing fuse bodies, increased the total output by 22 per cent, as shown in the accompanying table.
>
> OUTPUT OF MEN ENGAGED IN HEAVY WORK

| | Average Weekly Hours | | Relative Hourly Output | Relative Total Output |
|---|---|---|---|---|
| | * Nominal | *Actual | | |
| First Period | 66.7 | 58.2 | 100 | 100 |
| Second Period | 62.8 | 50.5 | 122 | 106 |
| Third Period | 56.5 | 51.2 | 139 | 122 |

> * "Nominal" means the hours spent in the factory. "Actual" means the nominal hours of work minus time lost for various reasons, such as waiting for work.
>
> Put in words, this table shows that:
>
> 1. When the men actually worked 58.2 hours (nominally 66.7), the relative hourly output was taken as 100 and the gross production as 100.
>
> 2. When they worked 50.5 hours (nominally 62.8) the relative hourly output was 122 and gross production 106.
>
> 3. When they worked 51.2 hours (nominally 56.5) the relative hourly output was 139 and the gross production 122.
>
> The Committee, in recommending reduction of hours, at the same time strongly recommended that the Sunday rest and ordinary holidays should not be interfered with.
>
> Towards the end of the war, the Industrial Fatigue (now Health) Research Board of the Medical Research Council was set up to study this and kindred problems. In a number of trades, e.g., steel and iron, glass, shell-making, laundry-work, the following observations confirming the war experience have been made:
>
> (i) An extension of the usual hours of work does not—except for short periods during an emergency—give a proportional increase of output: on the contrary it causes the rate of output to fall off with increasing rapidity. The main risk of over-long hours falls upon adult men,

[1] "Industrial Health in War." Emergency Report No. 1, Industrial Health Research Board. His Majesty's Stationery Office, London, 1940.

and particularly on the highly-skilled workers (tool and gauge-makers, tool-setters, etc.) who, because they are difficult to obtain, are most often employed for long hours. In addition long hours involve strain on the management, the executive staff, and the foremen.

(ii) After a continuous period of overtime, improvement in output rate does not take place for some time after the re-introduction of shorter hours.

Obviously the diminishing returns which result from increasing the working day are due to fatigue resulting from mental and physical strain. Although serious attempts have been made during the past 50 years to develop both a satisfactory knowledge and definition of fatigue, none has yet evolved. To be sure, a good deal is known about the physiological effects of fatigue, principally through studying the changes in the blood stream and muscles under conditions of extreme exhaustion. Unfortunately for us the physiological factors do not tell the whole story. The mental attitude and emotional conditions which result from such factors as monotony, emotional conflict, lack of interest and incentive in the work are felt to be as important as the changes which occur in the body.

***Rest Periods.*** Besides the factors of length of day and week another variable must be considered. In order to maintain a maximum rate of output, considerable experimentation has been conducted by introducing rest periods at regular intervals throughout the working day. Without question it has been established that judiciously assigned rest intervals, in the long run, tend to maintain output at a maximum. Such rest periods counteract monotony and strain and reduce the ravages of mental and bodily fatigue.

The most recent and outstanding experiment in this field has been conducted at the Hawthorne plant of the Western Electric Company. Again, the conditions under which rest periods are set up must be the determining factors in answering such questions as when, how long and how many the periods should be.

The work of the British Industrial Health Research Board also provides an example of the way rest periods act to maintain production schedules. Their work has led to the following generalizations:

(iii) An unbroken spell of four and a half to five hours is generally too long. Man must rest, even at work. In some kinds of work the man can pause to "stand easy" from time to time—or may have pauses thrust upon him, e.g. by having to wait for materials; but *organized* rest-pauses have been proved much more effective both to efficiency and health. The number and duration of rest-pauses depend on the nature of the work, but as a rule rests of ten or fifteen minutes about the middle of the morning and afternoon periods have been found to give satisfactory results. In some cases a break of five minutes every hour has been found better.

*Mental Factors.* It is probably true that the attitudes of workers are as important in maintaining the productive level as hours of work and fatigue. As a matter of fact, fatigue is known to generate attitudes which will lower the productive output of the individual. In recent years psychologists have devoted a good deal of time in trying to uncover the factors which contribute to job satisfaction. It has been shown that job dissatisfaction leads into a vicious circle. The job is the central core around which most lives are built, and it impinges upon and frequently alters the individual's opinions, attitudes and system of values. These in turn have a profound influence upon the individual's satisfactions in his work. Only recently has industry become aware of the findings of psychological research in this sphere.

#### FACTORS IN WORK SATISFACTION

Most managers have felt that the salary was the primary incentive for work and that there must be a high correlation between rate of pay and job satisfaction but considerable experimentation has shown it to be otherwise. In a recent study made by Seideman and Watson, the following classification of factors contributing to work satisfaction was demonstrated. The items appear in the order of their importance.

1. Vocational aspiration
2. Congenial work conditions and social contacts
3. Initiative, responsibility and prestige
4. Variety of tasks
5. Opportunity for promotion
6. Short working hours
7. Salary

Other investigators have presented similar lists and in practically every case it has been shown that salary is not the basic consideration in job satisfaction. Certainly job satisfaction alone does not necessarily mean higher productivity but, other things being equal, a satisfied worker is likely to be the best worker in a time when maximum productive efficiency is the aim of our defense industries. These factors must be taken into account in the establishment of the conditions under which productive expansion occurs. Without the emotional stimulus of actual war it is probably foolish to assume that the present enthusiasm for defense will be a strong or persistent enough emotion to displace the ordinary vocational desires of working men.

Industrial engineers have made much of time and motion study, job analysis and job evaluation. Without doubt the application of these practices contributes much toward increasing productive efficiency but unless they are introduced in such a way that the worker becomes a cooperative

partner in the project he is apt to feel that these are devices calculated to exploit him. Many industrial engineers have failed in their attempts to introduce the techniques of scientific management because they have refused to consider the psychological factors inherent in these devices which have profoundly influenced the attitude of the workers. When workers understand that these methods will increase their productivity, decrease their fatigue and in general simplify their work, they willingly cooperate.

## LIGHTING AND VENTILATION

*Lighting.* It would seem that the obvious relationship between good lighting and productive efficiency could be passed over with but brief mention. Actually, from the point of view of the general acceptance of the principle that good light means better work little more need be said. But when the evidence is examined there is considerable reason to believe that practice rarely squares with acceptance of the axiom, because knowledge of the elements involved in providing good industrial illumination is lacking in many plants. Inadequate illumination is known to slow down the rate of work, increase the amount of spoiled work, increase the frequency of accidents and produce long-time eye damage through strain. Slowing down in many men may be due to upsetting the fine psychological balance involved in the eye-hand coordinations which make all work possible.

Experiment and measurement are probably more extensive and precise in this field than in any of the others here reported.

Most of the discovered facts and conditions are readily applicable to any industry with a minimum of financial outlay, and preliminary investigation of conditions peculiar to the situation. The basic factors to be taken into account in appraising factory and office lighting are summarized in the following outlined discussion.

The essentials of good work lighting are:

(1) Best light conditions are given by daylight or artificial daylight closely approximating daylight, not only in diffuseness but in color and composition as well. Daylight as a source provides the optimum qualities for the normal human eye to see both quickly and accurately. But it must be remembered that a significantly large proportion of the population have less than normal vision.

(2) Since completely diffused daylight is rarely possible in modern industrial plants, the next best, i.e. artificial daylight, should be provided. Many of the so-called artificial daylights now in use or being installed fail to approximate the composition of daylight. It has been demonstrated that some of these sources are more harmful than beneficial.

Mazda light filtered through blue glass has been found to provide the

closest approximation to daylight. Not all blue glass is suitable as a filter. Nor are the commercially produced blue bulbs always dependable because the glass used lacks standardization. So far as known the newest tubular synthetic daylights (fluorescent) have not been tested for their qualitative similarity to elements found in daylight. The criteria for artificial daylight are: freedom from color, and composition which is essentially similar to daylight, which gives the eye its greatest power to discriminate between objects on a ground.

(3) If light is not properly diffused the illumination on an object is uneven and hence the image on the retina is not clearly represented. Ferree and Rand believe that the difference in diffusion between artificial light and daylight is the most important difference between them. The emphasis on intensity has tended to obscure the importance of diffusion. Diffusion of the light from factory sources can be measured. It should be made to conform as nearly as possible to a criterion of equal spread throughout the work area at the work level.

(4) A cause of much industrial hazard in men, machines and products has been a false notion of the value of brightness. High brightness is due to the lighting fixtures, the light source and the reflection from room and other surfaces. Glare is the chief result of high brightness and glare is dangerous and costly.

Optimum brightness is efficient and essential, high brightness cannot be afforded and should not be tolerated.

(5) The requirements of intensity of light are not constant for all people. Differences in the eye due to pathology, structure and age demand differences in light intensity. Therefore, some operations and some workers require separate light units.

***Ventilation.*** Little need be said here about the technical aspects of ventilation and temperature control. The work of the Division of Industrial Hygiene of the U. S. Public Health Service, the Bureau of Mines, and the N. Y. State Commission on Ventilation, among others, has been widely accepted by industry. The propagandizing for safety, so ably fostered by the National Safety Council and related state and local organizations, has done much to educate industry in the wisdom and practical utility of adequate temperature and ventilation control.

Eliminating the conditions caused by special processes of manufacture which should receive special handling by engineers, it should be clear that quality and quantity work are dependent upon the constant maintenance of favorable atmospheric conditions. The human organism at work functions best at external temperatures from 58° to 70° F., depending upon the activity. The supply of fresh air should not be less than 1,000 cubic feet per person per hour and the movement of air about 20 to 40 feet per minute

without currents or drafts. Humidity, always a potent influence on man, should seldom exceed 70 per cent, and where possible, should be considerably less.

However, a reminder that ventilation has, besides its physiological effects, profound psychological involvements, is not amiss.

Long before discernible bodily changes are recognizable, low oxygen or high carbon dioxide content in the air may produce psychological decrement of function. The individual's ability to discriminate may be affected in the fields of touch, sight, hearing and muscle sensitivity. The result may be increased spoilage of work and low unit output, or it may account for increased accident-proneness. Such results are costly and should not be tolerated in a modern industrial plant.

Other effects of faulty ventilation may find their way into the emotional life of the employee. Increased irritability, depression, frequent stops without apparent cause, inability to keep pace and continuous unwarranted fatigue are only a few of the consequences. One of the bad features of such a situation is that the causes of these conditions are often assigned to the workers themselves rather than to the real culprit—a defective ventilating system. This only adds insult to injury and complicates the employment picture all the more.

The purpose of these comments is only to point out, in a suggestive way, some of the complex psychological factors involved in the apparently innocent engineering job of heating and ventilation.

## PRACTICAL SUGGESTIONS

The foregoing discussion can be condensed into a brief series of important human factors to be checked in thinking through any program of industrial expansion.

(1) Employment of capable workers and reduction of labor turnover can be accomplished through the application of scientific psychological procedures.

(2) Ideally, selection, placement and the training of men should be placed in the hands of competent psychologists or psychologically trained personnel officers. If it is impractical to employ a psychologist, make use of a recognized organization of consulting psychologists who will develop and install a procedure and train your staff to work it.

(3) Consider carefully the conditions of work in the plant. Do not be fooled into believing that increased hours means increased output. Establish through experimentation the optimum length of day and length of week. Do not eliminate at least one full day off in each week.

(4) Introduce periodic rest intervals based upon a study of the condi-

tions peculiar to your industry. Take steps to relieve monotonous tasks.

(5) Introduce scientific but sensible time and motion study, job analysis and job evaluation, but only with the understanding and cooperation of the workers.

(6) In dealing with men take into account the important fact that pay is probably the least potent incentive for production. Job satisfaction and efficient work are dependent upon many other elements in addition to pay.

(7) Look to plant lighting, heating and ventilation as possible ways to increase productivity of men. At the same time remember that these physical conditions of the plant may be responsible for many subtle psychological failures. They often determine attitudes, emotional instability, rate of output, loss of time, accidents and other sources of human error.

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# APPRENTICE WAGE RATES

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**While the apprentice is first a learner, he is also an employee. On what basis then is he to be compensated? The Fair Labor Standards Act, of course, sets a lower limit on paying apprentices, but beyond that what are the best methods of compensation? In this, one of a series of articles on apprenticeship by different specialists, Mr. Harvey outlines certain principles for guidance and then reviews the wage and incentive plans that are commonly used.**

ANY consideration of apprentice wage rates presupposes an answer to the question: Should apprentices be paid wages at all? The remuneration of apprentices on a cash basis is the most common practice today. But this has not always been true, and it is not uncommon in some countries for the apprentice still to be required to pay a premium to learn his trade. What, then, are the reasons for the change?

## SHOULD APPRENTICES BE PAID WAGES?

First, of all, it is generally recognized that the apprentice falls into a special category: He is learning a skilled trade, and he is learning it while in private employment. It might be argued, therefore, that he should be required to pay for his teaching in the same manner as he would if he were attending a private school. The analogy, however, is not sound. In earlier days apprentices lived with, were fed, clothed, and educated by their employers [1] but payment in cash has now replaced payment in kind.

In the second place, although the apprentice might be considered as primarily one who is learning a skilled trade, he is also a producer. If the employer is going to train an apprentice, it is reasonable to expect that he should do so at no loss to himself. During the initial stages of the training process it is usually expected that he will operate at a loss, but also, and quite justifiably, that he will recoup that loss during the latter part of the training period. In general it is understood that he will balance considerations of profit and loss in terms of cash wages and overhead expenses as against the productive value of the apprentice.

A third reason for paying wages to apprentices is that, unless paid a reasonable wage, the apprentice is likely to seek another kind of employment, even though by doing so he abandons his intention of learning a skilled trade. If he does so while under an equitable written apprenticeship indenture he has, of course, sacrificed sound training for the temporary advantage of higher wages. Sometimes, however, and particularly when

[1] A survival of this old practice persists in those modern plants which provide their apprentices with tools and give them a bonus upon completion of their term of apprenticeship.

not indentured or where the indenture fails to provide a sound training program, pressure of financial need might justify such action.

The fact that the average apprentice of today is some two or three years older than was the apprentice of 50 years ago is further reason for the prevailing practice of paying higher wages than were paid then. The apprentice's needs and responsibilities are greater.

Thus, in general, it seems evident that in our modern economy apprentices must be paid wages. The next problem, then, is to determine whether such wages should be paid at a constant flat rate throughout the apprenticeship period, or on a progressively increasing scale.

### SHOULD WAGE RATE BE PROGRESSIVELY INCREASED?

An unvarying rate, no matter how good, fails to recognize the value of incentives. An apprentice likes to feel that he receives recognition for his increased value to the employer. Even though that recognition be small, it promotes satisfaction; and a wage increase is usually looked upon as more concrete expression of appreciation than a pat on the back.

Furthermore, there is a general tendency to assume that length of service should receive some recognition. The third-year apprentice, whether justifiably or not, feels that he should be paid more than the second-year apprentice regardless of whether or not he is in actual fact a more productive or more satisfactory worker.

Whether or not these human attitudes are illogical is beside the point. They exist and, unless acknowledged they result in dissatisfaction. In face of these facts alone, then, the payment of wages on an increasing scale would seem to be desirable as a stimulus to production. Still more significant, however, from the point of view of the employer, is the fact that experience has shown that an increasing scale of wages results in more accurate workmanship.

### FACTORS DETERMINING RATE OF INCREASE

What factors should be taken into consideration in determining the progressively increasing scale of wages? Obviously the initial determinants are the lower limit which, for the vast majority of employees, is already established by the Fair Labor Standards Act, and the upper limit, which is somewhat indefinitely set as the rate paid skilled workers in the trade concerned. How closely these two extremes should be approached is largely a matter of judgment.

In general it is agreed that big jumps should be avoided; a succession of numerous small intervals conforms more closely to the theory of learning and stimulates sustained effort more effectively than does a sporadic succession of occasional large intervals. In contrast, however, it is argued that

the provision of frequent increments increases the problems of bookkeeping and unwarrantably assumes on the part of the employer the ability to detect proportionately small improvements in the apprentice's ability. The solution is to be found in the establishment of reasonably noticeable increments at reasonably frequent intervals. There is no fixed rule in the matter; fundamentally the problem is one of judgment. The main objective in all cases should be to establish a scale which is reasonably flexible and reasonably continuous.

The question might be asked, of course, why one should increase the apprentice wage in accordance with a prearranged scale rather than arbitrarily in terms of the employer's estimate of the apprentice's worth at any given time. This question, however, confuses two issues: the desirability of insuring peace of mind, on the one hand, by guaranteeing a definite scale throughout the apprenticeship; and the recognition of exceptional individual ability, on the other. It will be considered more fully subsequently. For the moment it is assumed that consideration is limited to the establishment of a basic minimum guaranteed progressive scale of apprentice wage rates.

Accepting the beginning wage as being not less than that prescribed by law, the simplest solution of the problem would be to establish a wage scale progressing by equal increments over equal periods of time arranged to reach its maximum—namely, the rate paid to skilled workers—at the completion of the apprenticeship period. This would assume, however, that the learning process is similarly in a direct line. Actually it is not. The learner acquires his understanding of the trade more slowly at first and more rapidly toward the end of his training period. Thus it would be more appropriate if the earlier increments were smaller than those granted later in the apprenticeship period. Just what should be the nature of the curve of increments is, as already stated, a matter of judgment. The general principle of a gradually increasing rate of increment remains unaffected.[2]

Regardless of the nature of the increment curve, it would seem reasonable that the average wage rate, as determined for the apprenticeship period as a whole, should approximate 50 per cent of the skilled worker rate. This theoretical assumption is supported by factual evidence; a study of actual apprentice rates shows that, by and large, employers actually pay apprentices an average of even more than 50 per cent of the skilled worker rate.[3]

[2] Although it is common practice to specify apprentice wage rates on a fixed basis at so many cents an hour, it is more flexible and more convenient when established as a percentage of the rate paid to skilled workers. Thus, as the journeyman rate varies, the apprentice rate is automatically adjusted.

[3] Average hourly rate for skilled workers in machine shop industries is 86.4 cents, and for apprentices in the same shops it is 48.1 cents. See release No. 0780 of August 31, 1940, "Earnings of Machine Shop Employees," Bureau of Labor Statistics, U. S. Department of Labor.

It is not necessary, of course, that the average should be exactly 50 per cent; the main point is that the determination of the wage scale should take into account not only the upper and lower limits, which are fairly inflexible, but also the average throughout, which should be at least just and reasonable.

Thus, in summary, the principal determinants of a progressively increasing basic wage scale for apprentices are: the skilled worker rate; a reasonable average; the length of the increment period; the nature of the learning curve; the need for constant stimulus to sustained effort; and the relationship between cost and productivity.

## INCENTIVES

The discussion up to this point has been limited to a consideration of the basic minimum wage rate scale. Many employers, however, favor the policy of offering incentives above and beyond the basic minimum as a way of stimulating production and recognizing exceptional ability. A brief description of some of the more interesting incentive techniques is therefore in order.

The various kinds of incentive commonly used may be listed as follows:

1. Job preference after graduation.
2. Opportunities for specialized training.
3. Advancement as result of examination.
4. Provision of tools, textbooks, etc., free of charge.
5. Annual cash bonus.
6. Occasional bonus in pay envelope.
7. XYZ wage scales.
8. Piecework rates.

To encourage apprentices to complete the full term of apprenticeship, most firms promise to give special preference to their apprentice graduates, if and when jobs for skilled workers are available. In the event that such jobs are not immediately available, however, some firms offer the apprentice a guarantee of continued employment on specialized postgraduate work, during which time he is still eligible for any journeyman rating that may fall vacant.

Exceptionally able apprentices are sometimes given special opportunities to study highly specialized aspects of their trade. By agreement between the employer and the apprentice provision is sometimes made for such contingencies by inserting into the apprentice indenture a clause permitting the employer to give the apprentice intensive training on special work for a total period not in excess of six months out of the entire period of apprenticeship. Thus, for example, a certain apprentice of outstanding

ability in the foundry is given three months of special laboratory and shop training in the preparation and casting of rare metal alloys. Another, in the machine shop, is given particularly responsible work for an extra 4 months on the Lucas bar.

A few employers have established the examination system as an incentive. Periodically the work of the apprentice in shop and school is checked by a special committee. If the apprentice has shown exceptional merit it is recommended that he be advanced to a higher wage rate and be given more responsible work. This procedure tends to reduce slightly the total term of apprenticeship and to give the apprentice an opportunity to earn higher wages. Although as yet still in a pioneering stage, it promises to prove an exceedingly effective and desirable incentive.

The provision of free textbooks and tools, or payment for special schooling, is occasionally offered by employers as an incentive to their apprentices. Because these are usually offered to all apprentices as part of the general practice of the firm, this is not, properly speaking, an individual incentive. However, in view of the fact that the grant is made conditional upon continued service (if he should fail to complete his apprenticeship the apprentice returns to the employer all textbooks, tools, etc.), it may be looked upon as a stimulus to apprenticeship only in a general way.

#### CASH BONUSES

The payment of an annual cash bonus is of two kinds. When it depends on annual profits and is disbursed to all employees in proportion to length of service or size of salary, it is not, properly speaking, an incentive to apprenticeship as such. The more commonly practiced procedure, directly applied only as an apprenticeship incentive, involves the offer of an annual bonus of some round sum, such as $25.00 a year for each year of the apprenticeship. Usually this amount may be collected only at the expiration of the term of apprenticeship, or at such time prior thereto when, because of conditions outside of his control, the employer is forced to cancel the contract.

Although this device operates fairly successfully as an incentive for the apprentice to complete his full term of apprenticeship, it is not everywhere looked upon with favor, because it directs attention away from the main issue. Instead of being the cash acknowledgment of work done, as in wages, it has the appearance of being a personal gift from the employer. In our modern industrial society it would perhaps be more suitable if bonuses were to be included as wages or as a form of insurance rather than as incentives.

Probably one of the most commonly practiced incentives is that of occasionally including an extra amount in the weekly pay envelope. Never-

theless it is one of the most unsatisfactory incentives. The fact that it is sporadic and is based on no recognized principle leads to abuse and contempt. If one apprentice is better than another at the same level, some more scientific and generally acceptable principle for differentiating between them should be employed. Two such methods are described below.

What is sometimes known as the XYZ plan involves the establishment of (usually) three parallel wage rate series. The lowest is the guaranteed minimum for all apprentices. If an apprentice shows marked competence, he is transferred to the next wage rate level receiving two or three cents an hour more than the minimum. If he is exceptional he is raised to the topmost level, which is about four to six cents an hour more than the minimum. Shifts up or down from one level to another are made only after careful consideration of the apprentice's work and potentialities, and the apprentice is informed of his revised status. The desirable characteristics of this plan are: It gives proper recognition to individual competency; it permits of flexibility; and, most important of all, it is not arbitrary. The existence of three parallel wage scales is known to all apprentices equally, and it is understood that, once placed on a given scale, one will remain there continuously unless, after careful consideration, a transfer to some other scale is deemed appropriate.

### PIECE-RATE METHOD

The last type of wage incentive to be considered here is the piece-rate method. Not all employers are convinced of its desirability—indeed, the method has been the object of severe criticism by both employers and employees for many years—but as an incentive method it should be given consideration.

A crude piece-rate policy is undoubtedly vicious, regardless of immediate returns, and when applied to apprentices it can convey all the earmarks of exploitation, because in place of the learning function it substitutes productive output. The apprentice on a piecework basis becomes too interested in merely making bigger wages, and the foreman tends to forget to place primary insistence on the training aspects of the work.

On the other hand, piecework methods are customarily and widely used in industrial employment. Can a solution be found which will combine learning and piecework in the best possible way without detriment to the apprentice? Whether or not this has ever been done is open to question. Much depends on the point of view of the critic. Unfortunately, no carefully controlled study of the value of piecework incentives as applied specifically to apprentices has been conducted, with the result that current opinions are based largely on guesswork and special pleading.

Possibly, however, one could suggest certain controls which should be insisted upon in any apprenticeship system using piece-rate experience as part of the training program. First, the apprentice should be dealt with primarily and always as a trainee. No matter how skilful and productive his work, or how much extra he is able to earn on a given type of operation, he should be permitted to profit financially by his experience in that connection only to the extent that it furthers his training and augments his skill. Second, although every opportunity should be given the apprentice to demonstrate his ability, he should at no time be allowed to feel that his special success in a given type of work is more important than his training schedule as a whole. Third, although given piecework as a method of introducing him to the conditions prevalent in a highly competitive society, care should be taken to limit that special kind of experience to the minimum compatible with good sense.

## CONCLUSION

In concluding this article it might be well to state very briefly the fundamental principles to be observed in any carefully thought-out apprentice wage rate scheme: [4]

a. The wage scale should be established on a progressively increasing basis, within upper and lower limits already conveniently available, and about an average fairly representative of the worth of the average apprentice considered in relationship to that of the average skilled worker in the same trade.

b. The wage rate should be objectively determined and openly expressed, and should avoid any suggestion of paternalism. Differential rates are perfectly reasonable, provided again that they are based on acceptable non-arbitrary principles, and are openly expressed.

c. Although special wage incentives can be effectively employed, they should not be arbitrary; and never should the productive effectiveness of the incentive be allowed to obscure the fundamental training objective.

d. Above all, the wage scale should not be looked upon as being the sole or most important measure of the quality of an apprenticeship program. Employers, labor, educators, and the general public are agreed that apprenticeship is primarily a learning device; if the conditions under which that training is given are satisfactory, and the program itself adequate to produce competent all-round skilled workers, the fundamental requirements have been met. Under these guarantees it is generally acknowledged that the question of wage rates as applied to apprentices is a consideration of relatively secondary importance.

[4] See Appendix for illustrative cases.

# APPENDIX

## ILLUSTRATIONS OF APPRENTICE WAGE RATES

| Plant | State | Length of Apprenticeship | Wage Interval | ¢ or % | Contract Pay-Periods | | | | | | | | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | I | II | III | IV | V | VI | VII | VIII | |
| 1 | N. Y. | 8,000 hrs. | 1,000 hrs. | per cent | 64 | 70 | 75 | 80 | 84 | 88 | 92 | 96 | Based on journeyman rate |
| 2 | Penn. | 48 mos. | 6 mos. | per cent | 90 | 97 | 104 | 111 | 119 | 126 | 133 | 140 | Based on common laborer rate |
| 3 | Ohio | 8,400 hrs. | 1,050 hrs. | cents | 40 | 43 | 46 | 49 | 52 | 55 | 58 | 61 | Bonus $100 |
| 4 | Ill. | 8,320 hrs. | 1,040 hrs. | cents | 32 | 36 | 40 | 44 | 49 | 56 | 61 | 66 | Tool purchases reimbursed on completion of apprenticeship |
| 5 | Conn. | 8,000 hrs. | 1,000 hrs. | cents | 40 | 43 | 46 | 50 | 55 | 60 | 65 | 70 | |
| 6 | N. Y. | 4 yrs. | 1 year | cents | 20 | 20 | 26½ | 26½ | 31 | 31 | 36 | 36 | |
| 7 | Mass. | 48 mos. | 6 mos. | cents | 32 | 32 | 32 | 34 | 37 | 40 | 44 | 50 | Bonus $100 |
| 8 | N. Y. | 8,000 hrs. | 1,000 hrs. | cents | 25 | 27 | 29 | 32 | 35 | 38 | 42 | 46 | |
| 9 | Pa. | 48 mos. | 6 mos. | cents | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | |
| 10 | Mich. | 48 mos. | 6 mos. | cents | [1] | 55 | 60 | 65 | 70 | 75 | 80 | 85 | |
| 11 | Pa. | 8,448 hrs. | 1,056 hrs. | cents | 44 | 47 | 49 | 51 | 56 | 59 | 64 | 69 | |
| 12 | Ind. | 48 mos. | 6 mos. | cents | 30 | 33 | 36 | 39 | 42 | 45 | 50 | 55 | Range 35%—73% journeyman rate |
| 13 | Conn. | 8,000 hrs. | 1,000 hrs. | cents | 24 | 26 | 28 | 30 | 33 | 36 | 39 | 44 | |
| 14 | Wisc. | 8,320 hrs. | 1,040 hrs. | cents[2] | 32 | 36 | 40 | 44 | 48 | 52 | 56 | 62 | Textbook and bonus $100 |

[1] 45 cents first 3 months; 50 cents second 3 months.
[2] Superior apprentices receive 2 cents per hour extra above this minimum, and exceptional apprentices 4 cents an hour extra.

The above constitute the minimum wage rates offered to machinist apprentices in a selected group of 14 nationally-known metal trades plants (names of companies have been deliberately omitted). It should be noted, in explanation, that several of these are the rates that obtained prior to the enactment of the Federal Fair Labor Standards Act.

If it may be assumed that these illustrations are fairly typical of prevailing practices in the metal trades, three conclusions derived from an examination of this table would seem to be indicated. The conclusions are particularly interesting

because they are so paradoxical; if even only indicative, and not conclusive, they are still upsetting because so contradictory of current impressions. They may be expressed as follows:

1. As measured in terms of wages paid, the average apprentice is presumably worth at the end of his apprenticeship period only twice as much as he was at the beginning.

2. As determined according to the scale of wages paid, the average apprentice does not learn slowly at the beginning and more and more rapidly as he approaches the end of his apprenticeship period, but at about the same steady rate throughout.

3. As determined on the basis of available evidence (namely, the data here presented, and the publication referred to in footnote 3), there is reason to suspect that frequently a considerable gap occurs between the last wage received as an apprentice and the average rate received as a skilled worker. If this be true, it would seem to suggest that the average graduate apprentice has not been trained to an extent sufficient to justify his receiving the average skilled worker rate.

Comment on the above conclusions is unnecessary. They draw their own moral, and suggest the desirability of a more searching inquiry into our present rationale of determining apprentice wages.

# MERIT RATING OF SUPERVISORS, FOREMEN AND DEPARTMENT HEADS

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**Paralleling the current shortage of skilled labor is a scarcity of high-calibered executive talent. This "bottleneck in bosses" is likely to lead to an extension of supervisory merit-rating plans, which many companies have used effectively to appraise the performance and promotional potentialities of foremen and junior executives. Dean Knowles here presents a summary of the supervisory rating policies of a number of selected firms, and attempts to apply the best features of each to the establishment of a model merit-rating program.**

INCREASINGLY the watchword of management must be *greater output at lower cost* in order to survive under intensive competition. Consequently, the provision of competent leadership in the shop is of major concern to top management everywhere.

The growing emphasis on good management-labor relations attaches a new importance to those in supervisory positions.[1] Supervisors represent management to the worker, and it is universally true that the loyalty and respect accorded an organization can be no better than that accorded those who are in direct contact with the workers. Every progressive manager recognizes that where competent shop leadership is lacking it is impossible to achieve maximum efficiency. The following statement by the president and general manager of a large tool company calls particular attention to another aspect of this same problem:

"Due to a change in labor relations, it has been proved that many men directing and supervising the work of others have lost confidence in their supervisory ability. There was a time when the fact that a man was a foreman was sufficient in itself to carry weight with the workers. He was known as the 'Boss,' and workers followed orders. Today foremen and supervisors recognize that they cannot issue orders tactlessly to workers and expect to have them obeyed as in former years. This has resulted in many foremen losing confidence in their ability as leaders; it has made them uncertain of themselves, hesitant, and far less efficient as leaders of their departments."

Regardless of the care exercised in the selection of supervisors, the acid test of the value of each to his employer is demonstrated job competence.

[1] There is great disparity among industrial organizations regarding titles of supervisors. The titles commonly used include the following: foreman, gang boss, department superintendent, department head, department manager, etc. For purposes of this report, the term "supervisory rating" is used to designate merit rating as applied to those in job categories represented by the foregoing and similar titles.

Managers of small industries are in sufficiently close touch with foremen, supervisors and department heads to be constantly aware of their weak and strong points. In the medium-sized and large factory, however, the intimacy required to appraise supervisors and hold them to high standards of performance is almost entirely lacking. It is imperative, therefore, that top managers in such organizations be provided with tools for measuring the relative effectiveness of supervisors in their assigned jobs.

## SUPERVISORY RATING: SCOPE AND LIMITATIONS

Outstanding among the tools developed to aid management in appraising the effectiveness of its supervisory force is *supervisory rating*—a special phase of *man-rating* (commonly termed *merit rating*). It is concerned exclusively with the individual as related to his job, and provides a composite picture representing the considered opinions of those in a position to judge the effectiveness of supervisors in their work. These are stated in relation to specific factors, and to that extent are comparable and pertinent.

*Supervisory rating* is a special phase of merit rating. Consequently, its basic principles, methods and intended uses are very similar to the other phases of merit rating, namely, *employee rating*, which applies to shop workers, and *executive rating*, which attempts to appraise top executive efficiency.

Employee rating at any organization level aims at minimizing the amount of subjective judgment used to appraise the relative qualities of individuals in performing specific tasks. Much of the work of the supervisor, however, does not lend itself so readily to the use of objective measures as does shop worker performance. For example, shop workers are responsible primarily for the quality and quantity of their own output, care of their own tools, etc., while supervisors are responsible for an entire shop or department, the total performance of which is the result of many varying degrees of skills and often other factors over which supervisors may not exercise any direct control.

Completed ratings of supervisors are used by top executives in determination of the pay each should receive according to the judgment of next higher superiors. They are used also to guide management in the selection of suitable men for promotions, transfers, layoffs and special job assignments at or above the supervisory level.

## EXTENT OF SUPERVISORY RATING

Supervisory rating does not yet enjoy as widespread use as employee rating. Despite the realization that shop efficiency depends to a large degree upon leadership, most rating programs begin with employees and are gradu-

ally extended to include supervisors and top management. In those instances where rating is confined to shop workers, the results expected from the rating program are not always forthcoming, because the basic causes of inefficiency lie as much with the supervisory personnel as with their subordinates. Only when supervisors are held to high standards can employees be expected to attain superior morale and performance. Supervisory rating provides a means of doing this.

Of 43 firms reporting the rating of their employees in 1939, 17 reported the rating of supervisors, foremen, department heads and the like. Subsequent correspondence with firms claiming to have plans in operation reveals that some have had no real experience with a formal rating program (i.e., rating forms, supervisory job analyses, etc.). It is encouraging to note, however, that many firms report they are now developing formal supervisory rating plans, and it is reasonable to expect that the demands to be imposed upon shop management by the present emergency will increase their number. Supervisory rating, if used wisely, can be very helpful in bringing to light traits, characteristics and special abilities which are most needed today if industry is to do its share in defense.

## DEVELOPING A PROGRAM

A supervisory rating program is best developed on the individual firm basis. Seldom do existing plans fit the needs of particular firms. The development of the program itself cannot fail to arouse in those doing the rating, as well as in those rated, more interest in making the plan work—not only do they understand better the scope of their own work, but supervisors and top management alike become interested in the rating program and want it to be productive of desired results.

A committee should be appointed to develop and operate the rating system. Its chief duties will include careful consideration of each of the following steps:

(1) *Job Specification*—Establishment of requirements[2] for supervisory jobs if they do not already exist.

(2) *Purpose*—Formulating the aims and uses of the supervisory rating program.

(3) *The Rating Sheet*—Developing the *rating form,* selecting the *type of form* to be used; deciding upon the characteristics to be measured in the light of supervisory job analyses; developing a procedure for *scoring* (assigning point values to rating); determining a proper

[2] Where job and salary evaluation plans are in use, the specifications will be readily available.

system for *weighting individual traits* in relation to jobs; consideration of *application of objective measures.*

(4) *The Rating Procedure*—Determination of:

(a) Who will do the rating
(b) What instructions and training will be given those doing the rating
(c) How often ratings will be done
(d) Who will check completed ratings.

(5) *Use of the Results*—Formulation of policies regarding availability of ratings for general use of top executives, and reaching a decision as to how they shall be used to assist supervisors to improve their job competence.

(6) *Training of Raters*—Establishing and conducting a training program for those who are to make ratings.

(7) *Educational Program*—The organization and conduct of an educational program among supervisors themselves regarding the foregoing.

Typical rating committees now existing in industry are composed of representatives from personnel departments, administrative staff members (top executives), and supervisors themselves. Occasional committees, composed differently, consist solely of representatives from one category, such as top executives; and still others comprise members from many different sources, including subordinates of supervisors.

### 1. JOB SPECIFICATION

The appraisal of a person's effectiveness in any job can be truly meaningful only when there has been careful definition of the scope of the job, its limitations, and the demands it imposes on anyone who is to fill it properly. A good rating form, therefore, is one which attempts to measure the supervisor's performance in terms of what the proper fulfilment of his job demands. The selection of job requisites which apply in particular instances is best done by men familiar with the job under consideration—i.e., those working on the job (supervisors themselves), supervisors' superiors, and top management. A careful job specification will assist particularly in the accomplishment of the following:

(1) Determining the purpose of the rating program

(2) Deciding the characteristics and traits to be measured

(3) Providing a *fair* basis for comparing the measured performance in relation to that expected.

Because industries differ in the organization of operating personnel, no supervisory job is typical. Consequently it is impossible to present a job specification which would be applicable to supervisory jobs in all industries. The following, however, is a somewhat inclusive list of the type of information which organizations must seek in order to compile proper specifications for supervisory positions:

**Factors To Be Considered in Developing Job Specifications**

(1) *Skill and experience*—dexterity and accuracy; the degree of proficiency in manual and mental skills required; quickness, deftness, coordination of eye and muscles demanded.

(2) *Educational development and intelligence needed*—education required to fill job expressed as equivalent to grammar school, high school or college.

(3) *Responsibility*—demands imposed by job regarding safety of others, direction of subordinates; care that must be exercised in use of tools, equipment and machinery; degree to which accountable for process development and efficiency.

(4) *Physical effort needed*—the muscular effort and strength required to fill job properly.

(5) *Personality factors required*—appearance, carriage, voice, tact, ability to get along with others, cooperation demanded, character, common sense, intelligence, etc.

(6) *Leadership qualities needed*—initiative and ingenuity, originality, patience in dealing with others, capacities for growth.

(7) *Teaching abilities required*—requirements for training others and instructing subordinates; capacities for learning; demands job imposes in learning new methods, meeting new situations, grasping new ideas.

(8) *Personal productivity*—amount of work job required to be done personally by supervisor; diligence and care that must be exercised in fulfilment of duties.

(9) *Productivity required of unit for which responsible*—amount of output of satisfactory quality required to meet production schedules, departmental standards, etc.

(10) *Personal efficiency demanded*—care and accuracy needed to complete necessary records and reports; importance of promptness in completing own work as related to job.

(11) *Efficiency demanded of unit for which responsible*—extent to which economy and prevention of waste time, material and equipment must be achieved; need for orderliness of equipment, tools, etc.

(12) *Special requisites*—age limitations, citizenship, special language abilities, etc.

### 2. PURPOSE OF THE RATING PROGRAM

The usefulness of the results of any rating program is enhanced through restricting its purposes to as few as possible—preferably only one. Supervisory rating is used most commonly to aid in making decisions regarding these matters: salary determination, promotion, transfers, hiring, layoff, and discovery of individual weaknesses. Occasionally ratings are used as a guide in rehiring supervisors who have been temporarily discharged, but this is not a common use.

### 3. THE RATING SHEET

No two rating forms are exactly alike in appearance, but all attempt to measure the presence or absence in individuals of the characteristics which

are essential to meet the job requirements set forth in the job specifications. In the interest of a simple and clear rating form, however, the job specification factors must be rephrased and regrouped, and terminology developed that will cause the rater to think of the factors in terms of the capacity of an individual to meet them. Not only is it desirable to obtain the essential information through use of as few traits as possible, but also to describe the traits to be measured in simple language. Unless great care is taken in both connections, there will be confusion in the minds of the raters which will correspondingly lessen the value of the completed ratings.

***Type:*** Regardless of the characteristics to be measured and the intended purpose of a rating program, the rating form used will necessarily be modeled after one or a combination of these four general types of construction:[3]

(1) *The Graphic Rating Scale:* The traits to be measured are both named and described at one end of a linear scale five inches in length. Short, descriptive phrases appear at regular intervals beneath the line. The rater places a check mark on the scale at whatever point he believes the descriptive phrase most nearly fits the person under consideration. The numerical values equivalent to the check marks on the rating sheet are determined by means of a scoring stencil.

(2) *Rating by Letters:* Just as the achievement of a student may be indicated by a letter (A, B, C, D), so it is possible to measure and classify workers, as "E" for Excellent, "F" for Fair, etc. Since few people have the same conception of what these letters mean, it is very difficult to compare letter ratings. Competent authorities do not regard letter rating as a desirable technique to use unless there is very careful definition of each letter.

(3) *Rating by Grouping:* Educators have long recognized that the frequency of occurrence of certain intelligence levels among large groups of students may be expected to form a bell-shaped curve when represented graphically. (The ideal bell-shaped curve is based on the following groupings: 6% Superior, 22% Above Average, 44% Average, 22% Below Average, and 6% Unsatisfactory.) In like manner, it is assumed that *large groups* of employees will form a similar curve (perhaps slightly skewed as modified by social conditions).

The grouping method is productive of satisfactory results except that those who are classified as borderline cases between different groups may be treated unfairly. It possesses three primary advantages: it is easy to use and understand; it is more accurate than rating by letters; and it is simple to install.

[3] For detailed discussion, see Asa S. Knowles' "Merit Rating in Industry," *Research Bulletin No. 1*, Northeastern University Publications, February, 1940, page 6.

(4) *Specific Items:* Several traits are listed to be checked as existent or non-existent in the individual being rated. Rating by the "specific items" method has the advantage of speed, but the usefulness of the results achieved depends almost entirely upon the care with which the items to be appraised are selected, as well as the care taken in the preparation of the rating form to be used. Those who contemplate using it must avoid prejudices and bias insofar as possible and test the reliability of whatever form is prepared by comparing the results of its use with forms of known reliability.

A special questionnaire study[4] of supervisory rating reveals that each of the above types of rating sheet, except that of rating by letters, is in current use. Rating by grouping and the "specific items" method are most common. Four firms state that they use *numerical weights,* but this designation is nearly always a "specific items" procedure where rating is done by placing weighted numbers beside the trait instead of check marks.

***Scoring (Assigning Point Values to Ratings):*** Completed ratings have little value except as they are comparable, and this requires the adoption of a common unit of measure, i.e., a scoring system. In the physical sciences, various scales, conversion factors, and statistical measures are readily available. The precision of the comparisons made is limited by the precision with which the measurements are made. When dealing with human behavior, however, we have no convenient physical units of measurement. Ratings must be made as a matter of judgment rather than by means of an accurate scale. In rating employees, numerical scales and weights function as a device to facilitate more exact appraisal of personal characteristics by making possible comparisons of total scores computed for the individuals rated.

When a rater is asked to evaluate his estimate by a numerical scale (8 for Superior, etc.), he is in reality told to be precise. But since the selection and use of the scale involve individual judgment, the scale can only supply a common term for the expression of this judgment. *A primary requisite in setting up such a scale is that the designation for each separate rank between imperfection and perfection must be in proper relationship to the whole scale.* Just what arbitrary scale is selected is *unimportant* compared with a proper understanding of the scale by the raters and the interpretation of the final scores by executives.

***Weighting Individual Traits:*** Because particular traits are not of equal importance in the performance of supervisory jobs, it is necessary to construct *weights* which will give proper significance to each as related to a specific supervisory position—i.e., it is important to recognize various fac-

[4] Special questionnaire investigation of supervisory rating practices conducted by the Bureau of Business Research at Northeastern University, September, 1940.

tors as being *essential, desirable* or *unimportant* in the performance of a job. A weighting scale must be devised whereby each trait will be weighted according to its significance in filling the particular position held and there will be a proper balance in each of the categories (essential, etc.) as related to the job. For example, if no points were given a trait relatively unimportant to a particular job, but generally desirable in the character of all employees, this trait would be omitted from the rating. In fact, no irrelevant characteristic should be listed on a rating sheet.

Three possible scales for weighting the importance of traits with respect to jobs held by supervisors follow:

| | 1 | 2 | 3 |
|---|---|---|---|
| Essential to fill the job | 2 | 3 | 4 |
| Desirable " " " | 1 | 2 | 3 |
| Unimportant " " " | 0 | 1 | 2 |

Presumably, each of these scales supplies numerical units representing varying degrees of significance of traits with respect to jobs from *unimportant* to *essential.* In any such scale it is advantageous to have the distance between each of its designated degrees in proper relation to the whole range. For example, the distance between *desirable* and *essential* on the first scale is one-half the whole scale, which makes too wide a gap. In turn, this tends either to penalize or value too highly certain traits, the possession of which as essential or desirable in filling a job may be questionable. The second scale somewhat lessens this gap and gives the same trait, considered as *desirable,* one-third less weight than it would receive were it weighted as *essential* to a supervisory job. The third scale appears to be fairest in weighting traits in relation to jobs because it narrows still further the gap between *essential* and *desirable*—that is, to one-quarter the total scale.

The smaller the gap between the numerical weights in relation to the whole scale, the less will be the distortion of the total point ratings for various individuals.

***Application of Objective Measures:*** As already stated, supervisory rating does not lend itself so readily to objective measures as does employee rating. In this connection, some executives have suggested that supervisory and junior executive performance and capacities might be measured more specifically if provision were made to determine the degree to which supervisors meet standard costs as established for the work which they do themselves or for which they are responsible. There is no doubt that the demonstrated ability of supervisors and junior executives to keep actual costs in line with recommended or established standard costs is a fair indication of a type of efficiency, particularly in those organizations where standard costs have been in use for a considerable period and are, therefore, entirely fair.

It is significant, however, that at the present time none of the firms

studied by the writer appears to recognize the comparison of actual and standard costs as a measure of the effectiveness of supervisors in their jobs except as it may be considered indirectly in gauging quantity and quality performance. Undoubtedly, many could do so to advantage.

Careful reflection reveals some objections to using comparisons of actual and standard costs as measures of performance and ability. These are:

(1) When supervisors are subject to appraisal on the basis of their relative abilities to keep within the bounds of established or recommended standard costs, they are immediately dependent on the whims and accuracy of the Accounting Department. For example, accountants do not always agree on the classifications of expenses, and standard cost systems will vary from plant to plant and even in subsidiaries of a single organization. An appraisal of the results achieved by supervisors through comparison of their actual cost records with standard costs may lead to unfair criticisms and conclusions.

**RATING REPORT FOR SUPERVISORS, FOREMEN AND DEPARTMENT HEADS**

Name..... Division..... Date.....

Position..... Department..... Code.....

Note: Numbers in instructions correspond to column head numbers.

1. Read carefully the descriptions of the traits to be evaluated under each heading. Place a check mark in Column 1 under the heading of the division which most nearly expresses your considered judgment of each trait as applied to the person you are rating, i.e., Superior ( ), Above Average ( ), etc.

2. List in Column 2 those considerations stated under each trait which you believe to be deficiencies or weaknesses of the individual you are rating, i.e., neatness, voice, etc. Correction of the items you list will improve the individual's rating for this trait.

3. Each trait does not have equal bearing on all positions. To assure greater usefulness of the final results, raters must state their considered opinions of the relative significance of each as requisite to the job now held by the person rated, i.e., appearance, ability to get along with others, etc. Post in Column 3 the weight you accord each item as follows:

| For items: | Assign weight of: |
|---|---|
| Essential to fill position properly | 4 |
| Desirable to fill position properly | 3 |
| Unimportant to fill position properly | 2 |

4. To determine the point rating for each trait (R x W), multiply the point value of the rating recorded in Column 1 by its assigned weight in Column 3 and post in Column 4. Rating values are as follows:

| | | | |
|---|---|---|---|
| Superior | 8 | Average | 4 |
| Above Average | 6 | Below Average | 2 |
| | Unsatisfactory 0 | | |

5. Column 5 is for use of the Personnel Department in reviewing and re-grading point ratings.

(Continued on following pages)

| | 1 | | | | | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|---|---|---|
| | Superior | Above Aver. | Average | Below Aver. | Unsatis. | Remarks | Weight | Point Rating (R x W) | Review |
| **I. Personality:** | | | | | | | | | |
| (a) Appearance<br>Consider dress, manner, physique, neatness, voice. | | | | | | | | | |
| (b) Ability to get along with others<br>Consider courtesy and tact, temperament and self-control. | | | | | | | | | |
| (c) Character<br>Consider dependability, sincerity, courage and consideration for others. | | | | | | | | | |
| (d) Intelligence<br>Consider ability to learn, mental alertness, judgment, imagination, flexibility in handling new problems, ability to reason logically. | | | | | | | | | |
| **Total Personality Point Rating:** | | | | | | | | | |
| **II. Performance:** | | | | | | | | | |
| (a) Personal productivity<br>Consider use of own working time and amount of work done personally (not by unit for which person rated is responsible); consider also diligence in fulfilling duties. | | | | | | | | | |
| (b) Productivity of unit for which responsible<br>Consider amount of output or accomplishment of satisfactory quality. | | | | | | | | | |
| (c) Personal efficiency<br>Consider promptness in completing work for which person rated is personally responsible; care and accuracy in completing necessary records and reports. | | | | | | | | | |
| (d) Efficiency of unit for which responsible<br>Consider economy in operation; prevention of waste of material, time and equipment; accident record of subordinates; care and orderliness of equipment and tools. | | | | | | | | | |
| **Total Performance Point Rating:** | | | | | | | | | |
| **III. Executive Capacities:** | | | | | | | | | |
| (a) Initiative | | | | | | | | | |

of waste of material, time and equipment; accident record of subordinates; care and orderliness of equipment and tools.

**Total Performance Point Rating:**

**III. Executive Capacities:**

(a) Initiative

Consider energy, ingenuity, self-starting ability.

(b) Organizing ability

Consider ability to select effective personnel, to plan and coordinate systematically, to determine policies, and make clear assignments of responsibility and authority.

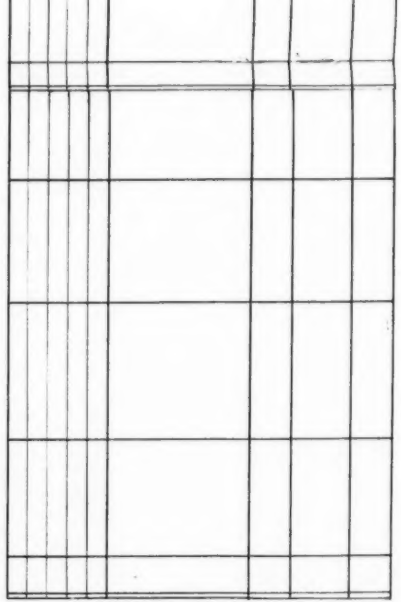
(c) Leadership

Consider ability to influence others by examples of good work, qualities for inspiring others, teaching ability, patience and firmness in dealing with subordinates, freedom from prejudice and bias.

(d) Cooperation

Consider capacities for teamwork, freedom from jealousy, willingness to subordinate personal desires, loyalty to fellow supervisors, company officials, etc.

**Total Executive Capacities Point Rating:**



**DO NOT FILL IN THIS SPACE**

**Rating Summary:**

I. Personality.....

II. Performance.....

III. Executive Capacities.....

**Total Point Rating:**

**Over-all Rating Scale**

(Expressed as percentage of total possible score)

88-100.....Superior
63-87 .....Above Average
38-62 .....Average
13-37 .....Below Average
0-12 .....Unsatisfactory

Rated by.....

Position.....

Reviewed by.....

Filed.....date

(2) Many industries where supervisory rating is sorely needed do not lend themselves to the effective use of standard cost systems. This is particularly true of industries that must constantly retool, change product lines, etc. Standard cost data either does not exist or is not sufficiently reliable to justify use in a rating system. (Firms having no standard costs and considering the adoption of supervisory rating might be less inclined to adopt it if it appeared to involve the establishment of a standard cost system.)

(3) The use of a standard cost system can never measure the abilities needed to cope with the imponderables which arise in handling people and unusual events, which are perhaps the most important items to measure in a supervisory rating program.

#### 4. THE RATING PROCEDURE

*Who Will Rate:* Among the typical firms having considerable experience in supervisory rating, the actual rating is done by officials and other supervisors next in rank above the supervisors rated, or by top executives. Of 14 firms replying to a questionnaire which sought information on this point, only one stated that rating is done exclusively by the personnel department. Some organizations ask supervisors of the same rank to rate one another. Where this is done, great care must be taken to check the results for possible prejudices and bias.

*Instructions:* It is most important that uniform instructions be given those who are to do the actual rating. Unless the same terminology and rules are applied by all who rate any individual, the results achieved will not be comparable and the persons rated may suffer from unfair treatment.

*Frequency of Ratings:* While new supervisors occasionally are rated semi-annually, the ordinary practice is to rate all supervisors once a year. Those cooperating in the special questionnaire study noted these special occasions:

"Prior to any change in supervision."

"Change of position."

"When some occasion suggests desirability."

*Checking and Reviewing:* Most firms agree that it is good practice to have the completed ratings checked or reviewed by members of the personnel department or some officers higher than the persons doing the rating. Moreover, it is generally thought the new rating should be compared with previous ones. The comparisons are usually made by the personnel department, where data regarding individuals are on file. The principal value of reviewing is to reveal any great discrepancies in ratings and to ascertain whether or not supervisors are making progress. No company replying to the special questionnaire on supervisory rating

reports that previous ratings are consulted prior to making new ones. It appears to be the belief of most industries that reference to previous ratings can only arouse prejudices and biases and prevent giving credit for corrected faults.

### 5. USE OF THE RESULTS

Completed ratings are most useful when they are analyzed to show how well individual supervisors meet the requirements of their jobs as defined in the specifications for their positions. With few exceptions, the firms whose plans were studied by the author discuss completed ratings with each supervisor. A primary purpose of rating programs is to uncover any individual shortcomings and to use completed ratings as a basis for making constructive suggestions. Ratings should never be concealed lest some supervisors come to doubt their real purpose. Secrecy regarding the results can only breed distrust and poor morale.

### 6. TRAINING OF RATERS

The best results from any rating program are possible only when both the raters and those rated have a clear understanding of its purposes and the techniques by which they are to be accomplished. As yet too little attention has been given to proper education to introduce and assure success of the rating program. Most supervisory rating sheets contain brief prefatory instructions which help to insure uniformity in procedure. Typical of these are those which appear on the rating sheet reproduced herein.

Almost without exception, those who rate supervisors are instructed to deliberate in making ratings. This is sound practice and is particularly productive of results when raters discuss among themselves the persons being rated. The discussion method is principally used, however, in modifying separate ratings already made privately. One progressive company reports that this type of deliberation is undertaken only when ratings are reviewed by the next higher official.

The purpose of rating is to minimize prejudices and bias so prevalent in subjective judgment everywhere. Every effort should be made not only to present clear instructions but also to encourage deliberation and open discussion in order to provide a truly composite picture of an individual's real worth. The best results from a rating program will be obtained in those industries where adequate training courses and discussion groups consider rating from every possible angle. It should be the function of the committee in charge of supervisory rating to meet periodically with those who rate supervisors and provide opportunities for discussion of the program in use. Such discussion groups could be the nucleus for

the development of a rating manual to be used by others less familiar with the rating program who may be called upon to participate in it.

#### 7. EDUCATIONAL PROGRAM

Supervisors should be thoroughly acquainted with the factors by which they are appraised in order that they may make the best possible showing with respect to each. The method of weighting and scoring the rating form should be explained to them, and they should be allowed to criticize features of the rating form which they believe to be unfair. Furthermore, the success of the program is by no means certain unless supervisors are given these assurances regarding the rating program: (1) Ratings are to be made fairly and without discrimination; (2) all ratings will be reviewed by impartial judges; (3) ratings will be used to improve a man's worth to the firm and not as a weapon of dismissal; (4) each man rated will be given a clear picture of his rating and an opportunity to defend himself if he is convinced that he has been treated unfairly.

### DANGERS OF SUPERVISORY RATING

The primary sources of danger in any rating program are the rater himself, the rating form, the frequency of making ratings, secrecy regarding the results, and inadequate education.

***The Rater Himself:*** The results to be achieved from supervisory rating can be no better than the judgment, honesty and fairness of those who administer it. In order to protect supervisors against possible dangers which may arise in this connection, it is desirable that the rater be required to justify his ratings. Moreover, care must be taken to assure that ratings are always reviewed by superiors and compared with previous ones.

***The Form:*** Too much care cannot be exercised in the selection of traits to be measured and the formulation of clear definitions. If this is not done, rating results are likely to be unsatisfactory. Forms should be printed attractively on good paper so that those who are to rate will attach due importance to what they are doing. (A mimeographed form has a bad psychological effect.)

***Frequency:*** When ratings are made too often, they become irksome and the results suffer from haste on the part of the raters. The committee in charge of developing rating must see to it that ratings are made with sufficient frequency to be useful and comparable, but it must guard against too frequent ratings.

***Secrecy:*** The primary purpose of ratings is to correct shortcomings of those who are rated. Each supervisor is entitled to a frequent imper-

sonal, constructive discussion of his rating. Unless this is done, animosity and distrust will be aroused and forestall intended benefits for both top management and supervisors.

***Inadequate Education:*** Possibly the greatest danger to any rating program is lack of understanding of its purposes and uses. No matter what amount of care is exercised in developing a system and how fair it is in execution, unless its purposes and intended uses are made very clear to those who are affected by it, the program will be enshrouded with mystery and give rise to suspicion and distrust. Such misunderstanding can only nullify the whole rating program.

## SUGGESTED SUPERVISORY RATING PROGRAM

The supervisory rating form shown on pages 126-7 represents some of the best construction features and content of several rating programs now in operation. It is not intended for use in any particular business or type of organization but is merely a suggested model from which companies may develop their own rating sheet. The form has been designed with two main objectives, i.e.:

(1) The measurement of the effectiveness of supervisors in their present positions; and, as a corollary, the improvement of supervisory effectiveness by calling attention to individual weaknesses that can be corrected.

(2) The selection and guidance of men for promotion (in particular, those capable of filling executive posts).

Possible by-products of the achievement of these main objectives will be the following: (1) Completed ratings will serve as a guide in the determination of supervisors' salaries; (2) management's attention will be called to particular factors in individual cases, i.e., special abilities, capacities for special job assignments, etc.; (3) information of value in deciding upon transfers will be readily available.

The form classifies the characteristics measured under three major headings: personality, performance, and executive capacities. An attempt has been made to prevent duplication of characteristics and traits listed for measurement, but the writer appreciates that different interpretations of the terms used may justify criticisms in any reader's mind. The form is to be filled out by the immediate superior of the person rated and by fellow supervisors on a semi-annual or annual basis.

Instructions for using the rating form appear at the beginning of the sheet. These are numbered to correspond with the columns. In Column 1 the person rated is checked as Superior, Above Average, etc., with respect to the traits listed. Column 2 provides space for recording the rater's observations of weaknesses or shortcomings of the individual under each trait. These

remarks will prove helpful when referring to the form at some later time, and serve indirectly as a means of *justification* of each rating.

All traits do not have an equal bearing on all supervisory positions, and, consequently, provision is made in Column 3 for weighting each trait as essential, desirable or unimportant to the particular job held by the supervisor being rated. Column 4 records the total point rating, calculated by multiplying the assigned weights by the rating values shown under Instruction 4. In keeping with desired practice, Column 5 provides space for the personnel department review of the ratings.

Considerable care was exercised in the selection of the points to be assigned the ratings of individual traits, as well as their weights, for purposes of this particular rating sheet. The rating sheet demands that supervisors be rated on a scale ranging from 8 points, for Superior, to 0, for Unsatisfactory, and that traits be weighted with respect to the job held by the supervisor, as: *essential,* 4; *desirable,* 3; *unimportant,* 2. This does not mean that these values are to be accepted universally by companies as fitting all needs; they should be used only as a *guide* for those who are undertaking the establishment of a supervisory rating program. The point values and weights used by various companies having supervisory rating programs are meaningful only as they are carefully defined by those who use them.

This rating sheet recognizes that total ratings for various supervisors must be comparable or they will possess little value, i.e., individual ratings must be reduced to total scores which may be compared with similar ratings. Provision is made to do this on the reverse side of the form under the heading: "Over-all Rating Scale (expressed as percentage of total possible score)."

It will be recalled that the form illustrated provides for weighting each trait according to its importance to the job held by the supervisor. Consequently, if the ratings made on this particular form are to be numerically comparable, it is necessary to eliminate from consideration the importance of each trait in relation to particular jobs shown in Column 3. This may be accomplished by multiplying the sum of the weight column by the maximum possible rating of 8, and then using the result as a base to find a percentage which expresses the total point rating attained as related to the maximum attainable, i.e., $\frac{\text{total point rating score}}{\text{maximum possible score}}$, or, $\frac{R \times W}{8 \quad W}$. The percentages for determining whether the over-all rating given any individual is Superior, Above Average, etc., are shown on the form.

#### USES OF THE COMPLETED RATING FORM

The primary uses of the rating sheet are those stated as its two major purposes: (1) the uncovering and correction of individual weaknesses, and (2) selection of men for promotion, etc.

Column 2 of the rating sheet provides the opportunity for recording the sub-factors which define each of the traits listed and which are lacking or unsatisfactory in the person rated. These weaknesses are naturally reflected in the effectiveness with which supervisors fill their jobs. They should be made known to them in order that they may bend every effort toward improving their worth to their employers.

The rating sheet provides valuable information which can be used to determine the promotional potentialities of supervisors. The following steps of a clerical nature are requisite to the achievement of this end:

(1) Standard weights for each trait as related to a specific supervisory job should be established. The weights recorded for the traits listed on the rating sheet show what raters believe to be their relative importance to the supervisory position. These should be used to establish composite *standard weights,* which will be different for each supervisory position under consideration.

(2) The *point ratings* for each trait given supervisors by raters in checking Column 1 should be averaged separately. The average score for each trait should be entered on a permanent file copy.

(3) When occasion arises to select a man for promotion (or transfer), the data compiled in steps 1 and 2 can be used in conjunction to determine which supervisors are best suited for the positions involved: i.e., the *point ratings* of supervisors can be multiplied by the *standard weights* established for the traits as related to the particular position. This will give a score which can become an important guide in determining the degree to which each supervisor may be expected to meet the qualifications demanded by the position to be filled.

Completed ratings can be used effectively also to aid ambitious employees in preparing themselves for positions above their present rank. Multiplication of any supervisor's point ratings by standard weights assigned the traits requisite to fill positions above his rank provides a tool by which top management may give intelligent guidance to subordinates. Careful study of the resulting scores will indicate the kind of work for which each supervisor is best suited, and, consequently, the training that he should undertake.

# REDUCTION OF DEFECTIVE WORKMANSHIP— AN INDUSTRIAL RELATIONS FUNCTION

By T. O. ARMSTRONG
Industrial Relations Supervisor, East Springfield Works
Westinghouse Electric & Manufacturing Company

**When production activity expands, when companies go from single- to multiple-shift operations, and the general accent is on greater output, then scrap and rejects mount. In this article is told how the Industrial Relations Department of the East Springfield Works of Westinghouse went to work on reducing the waste caused by defective workmanship. The article describes how the program was mapped out, how the union was called into the campaign, and also how the defective workmanship bogey was licked.**

MANY personnel executives may feel that reduction of defective workmanship is not a characteristic industrial relations activity. However, the part played by the Industrial Relations Department in the waste control program at the East Springfield Works of the Westinghouse Company shows how effectively the industrial relations function can be utilized in such an endeavor.

This program is three years old and has had time to prove its worth. It should not be classed with short-run campaigns, budget control methods, foremanship conferences, supervisory incentives, etc. Rather, it is a plan of operation to keep before the worker at all times his responsibility and the part he plays in keeping the organization for which he works a going and successful unit of production.

## COST OF DEFECTIVE WORKMANSHIP

In 1937, when a review of the loss account showed that at any given period the Defective Workmanship Account constituted the largest portion of the whole, we began our campaign to reduce waste and defective workmanship. The account for defective workmanship charges was made up of variable non-recurring items, each involving merely minor expense but in the aggregate mounting to a tremendous total.

In one division the cost of waste and defective workmanship added approximately one dollar to the over-all cost of each unit produced, the aggregate of which would amount to a quarter of a million dollars in a normal production year. Again, through defective workmanship, another division manufacturing a product which involved a greater capital investment per unit added nearly five dollars per unit produced.

Intensive study of records and data indicated the following divisions of costs for waste and defective workmanship:

*Recurrent Troubles.* A portion of the scrap loss was found to be of

a nature where the same fault appears regularly and more or less uniformly throughout production. The cause is apt to be fault in design, materials, process or manufacturing equipment, and can only be corrected through design or manufacturing engineering.

***Epidemic Troubles.*** About a quarter of the total cost over a long period of time was due to "epidemic" troubles—losses due to inadequate control of materials, processes or manufacturing. Correction of these difficulties is an inspection or test function, or an engineering function, or both.

***Miscellaneous.*** About half of the total cost of waste was due to defective workmanship.

Epidemic and recurrent troubles, then—neither of which the worker has any responsibility for—accounted for half the waste; but the other 50 per cent could be directly charged to the failure of the workman to produce as good a product as possible with the materials, equipment or processes made available. Clearly, the only remedy here is increased care by each workman, and a continued interest and desire on his part to *put* quality into his work and into the product.

Reorganization of inspection and test personnel and the addition of a process control group and a quality control laboratory—a training institute for inspection and test personnel—were some of the first things done and with some degree of success. However, as someone said, "Quality must be built into a product, it cannot be inspected into it." Regardless of the number or type of inspectors you have, active support must be given by the manufacturing personnel in order to insure satisfactory results.

## TASK OF THE INDUSTRIAL RELATIONS DEPARTMENT

The task of securing the workers' cooperation was delegated to the Industrial Relations Department, primarily because defective workmanship is a human fault and therefore an industrial relations problem. The basic plan was to get the worker voluntarily to accept this responsibility and also to appreciate fully how a reduction in scrap losses would benefit him.

The Westinghouse Adjusted Compensation Plan provided a very effective means by which the worker could be made to realize that the responsibility to reduce defective workmanship was a real and personal one. Under this plan, the company's net income for any three consecutive months determines the pay that employees receive for the next succeeding month. The plan provides for an increase of 1 per cent in wages and salaries for each increase of $60,000 in the earnings of the company over and above $600,000 average monthly earnings. When the net income is less than this $600,000 average, that portion of each salaried employee's salary over

$118.75 per month is subjected to a 1 per cent reduction for each unit of $60,000 that the net income is below the $600,000 average.

The Company kept driving home the fact that "every dollar saved contributes to the pay of every employee" since scrap charges naturally lower the company's net income.

The underlying purpose of the campaign was to acquaint the entire working personnel with the facts concerning losses, and appeal to their natural pride in their jobs, as well as their self-interest, to bring about the exercise of greater care. It was planned to hold direct discussion of individual faults with the workmen involved, through committee meetings. The cause of the trouble and the cost entailed would be investigated here, and the workman, of course, would present his "side of the story." Then, as a group, the committee would try to determine how the difficulty could be eliminated. In other words, in every case the idea was to reach the individual workman at fault and convert him to the reduction program.

#### EXPERIMENTAL TRIAL

The plan was given an experimental trial in one of the divisions. Employees whose work had been defective met with the chief inspector of the division, superintendent, foremen, and representatives. The chief inspector called the meetings and selected the subjects for discussion.

The workmen's initial reaction to the plan was one of resistance, owing probably to a degree of fear as to what the plan might involve—i.e., spying, discharge, etc. In a reasonable time, however, they were convinced that the intent of the plan was constructive. The records showed improvement in the divisional account, both in dollars and percentage of productive labor, and it was finally decided that the time was opportune for a plantwide effort.

#### UNION COOPERATION SECURED

The next step was to enlist the support of the union committee, at the same time giving them an opportunity as a responsible labor organization to make a constructive contribution to the welfare of the plant. Following a meeting of management and employee representatives, union officials published an editorial in their news organ, *The United Front,* presenting the facts outlined at the meeting and asking for continued cooperation against the common enemy, "Scrap."

In response to employees' requests for more information on the campaign, we decided to remove the existing bulletin boards and to issue a periodical "news letter." This was also entitled *The United Front* at first, and carried the Westinghouse trademark and the official seal of Local 202. It was edited by both management and officials of the union. The first issue printed a copy of the union's acceptance of the plan and a statement

from management on what had been done to create a continued interest in the campaign.

### NEW METHOD OF SCRAP ACCOUNTING

A general meeting of all who had taken an active part in the campaign preceded the distribution of this news letter to all employees. A review of the campaign for the year was presented, past problems discussed, and suggestions and criticisms offered. An important change in the method of scrap accounting was announced. Under this new method the total scrap charge was separated into two divisions, one covering losses beyond the employees' control, and the other covering losses for which the employees themselves were responsible. The latter was designated the 45-W or defective workmanship account, and popularly referred to as the "45 Charge."

### COMMITTEE MEETINGS

With the support of the union assured, local departmental committees were established, each committee consisting of chairman, secretary, representative, worker, foreman and visitor. In various departments, the office of chairman was held by the foreman, the representative or a workman elected by the employees of the department. The office of secretary, however, was held by the departmental inspector, since it was his responsibility to arrange subject material, gathered from the scrap tags accumulated and investigated by him prior to the meeting. The visitors attending the meetings were representatives of industrial relations, the chief inspector, a union official, the manager, or the divisional superintendent. The procedure of these meetings followed the pattern of procedure set up for the experimental trial.

Divisional meetings, with the superintendent as chairman, were also held once each month and were attended by the divisional chief inspector, the departmental chairman, foreman and representatives, for the purpose of reporting progress and discussing problems of interdepartmental committee work. Occasionally general plant meetings were called to show the progress of the plan. A typical program of one of these general meetings would include addresses on the scrap account, by the industrial relations supervisor, an inspector, a foreman, a group leader, a workman, a union representative and the Works Manager.

### CONTENT OF DISCUSSION

Departmental minutes of meetings kept by the committee secretary are placed on file, their prime purpose being to record the progress made in solving problems brought up for discussion. The sample set of minutes which follows (see Figure 1) illustrates the content of meeting discussions.

Date, Jan. 2, 1938 Dept., Q-70 Divn., Refrig.
Present Messrs. Palmer, Hitt, Goold, Norman, Armstrong, and Atherton
Old Business:
#1 An air line has ben installed to blow dirt off contacts while they are being wire brushed. This installation has improved the condition of dirty contacts. ITEM CLOSED

#2 The subject of heat exchangers taken up at the last meeting was discussed. Mr. Bagnall suggested that he have further time to investigate. Progress was being shown but suggested item be carried in the minutes a while longer. ITEM OPEN

NEW BUSINESS:
#15 Leaky Center Welds. Samples displayed and faults discussed with the worker. Decision of the committee was that this item should be investigated further, as it seemed unavoidable insofar as the operator was concerned. Mr. Paounoff to report at next meeting.

#16 Bellows. It was reported that dented bellows were being received in the department caused by poor packing from Department B-5. Representative of Dept. B-5 present, item discussed. Mr. Jones of B-5 is to take this matter up with his committee.

Comments:

The Plant's Chief Inspector was present and gave an interesting outline of the progress of the campaign in the plant. He presented charts illustrating the trend in our division, which indicated progress.

The Industrial Relations Supervisor was also present and gave an interesting talk on the values of these meetings, in knowing the "Why" as well as the "How."

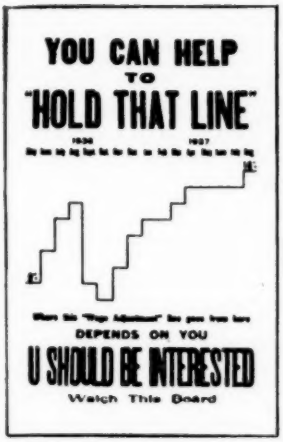
**FIGURE 1. Sample set of committee meeting minutes.**

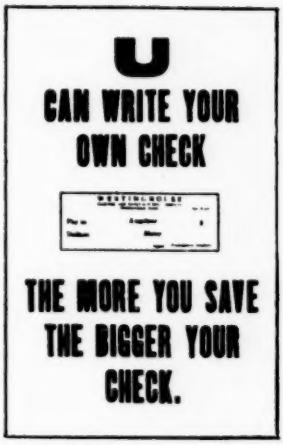
#### CAMPAIGN PUBLICITY

Publicity was found to be most important in connection with the campaign. After the program was announced, interest was maintained through the use of about 50 posters, which were changed weekly and distributed throughout the plant. Many of the slogans and posters were suggested by the employees themselves. The official news organ of the union reprinted many of the posters and slogans used and contributed greatly with timely articles relating to the work being done.

Management stressed the direct benefits from the program under the Adjusted Compensation Plan by frequent reminders (see Figure 2) and pointed out that:

> In addition there are other ways in which a constant regard for quality on the part of the workman pays dividends.
>
> Waste increases cost and since we are in a competitive business, cost increases bring a resultant decrease in the work to be done by the workmen in the plant. For example:
>
> We purchase many parts outside because we must keep our costs of the total product within the limitations of competition and the consumers' ability to pay. Outside suppliers can often quote us prices lower than the cost that we can manufacture these items for, and as a result they get the order.
>
> Many times the margin is not greater than the extra cost that we *must* add due to SCRAP losses, so that the elimination or reduction in the scrap



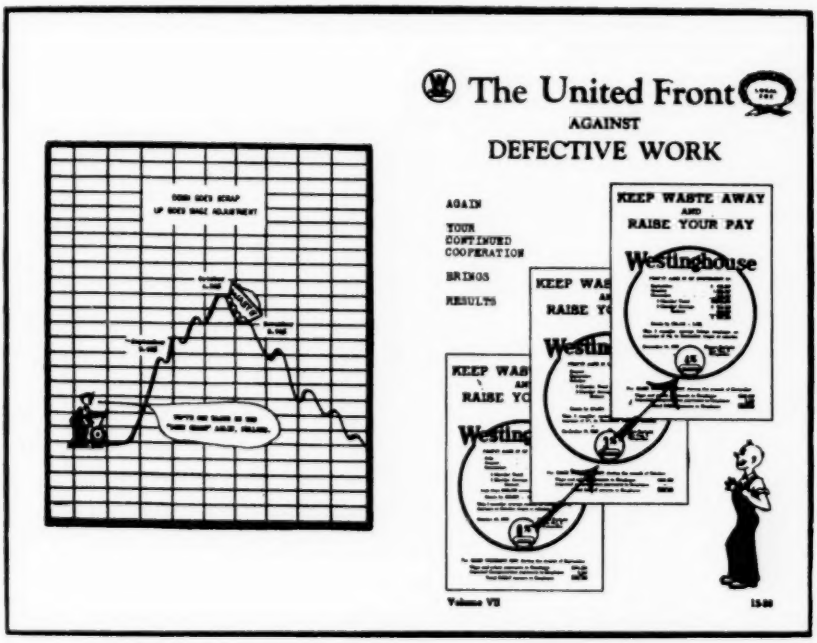




FIGURE 2. Some posters used to stimulate workers' interest in the program.

losses opens a way to manufacture many of our parts which otherwise must be purchased outside.

This same situation sometimes exists in respect to our completed product. For instance a product being manufactured is discontinued because of excessive manufacturing costs, or field and customer troubles, both of which could be reduced by a better control of quality.

### COMPETITION BETWEEN DEPARTMENTS STIMULATED

Through a leaflet called "The United Front for Good Workmanship," which was issued periodically, the campaign was kept constantly before the employees. To stimulate a competitive spirit, the campaign record, reporting trends in the defective workmanship account by divisions and by departments, was closely followed in these bulletins.

In 1940 a new bulletin entitled "Highlights in Good Workmanship" was issued in an attempt to appeal to the pride of the workers. The publication features workers who have made outstanding records in good workmanship over a long period of time. Qualified workers are nominated for this honor by the departmental foremen. Each employee mentioned for good workmanship in these bulletins receives a letter from the Works Manager at his home, congratulating him or her upon efficiency. He is also awarded a certificate of recognition.

### SHARP DOWNWARD TREND IN WORKMANSHIP CHARGES

The effectiveness of the East Springfield program is demonstrated by the sharp downward trend in the ratio of defective workmanship charges to productive labor. In 1939 there was an improvement of 47 per cent over 1937 and 31 per cent over 1938. In 1940 to date, there has been an improvement of 24 per cent over 1939. (See Figure 3.) The Feeder Division set a plant record by performing seven operations on 700,000 refrigerator brackets without any scrap from January 1, 1939, to June 1, 1939. In the Air Conditioning Division another group of workers reduced the number of rejects of all valve plates produced from 80 per cent in 1937 to 1 per cent in 1940.

The program has developed a fine spirit of cooperation in attacking a difficult problem. From an industrial relations point of view, perhaps this was its greatest contribution. Even more important than the benefits which can be stated in dollars and cents are the intangible benefits derived from the educational and informal aspects of the departmental and divisional committee meetings. There was free interchange of opinion at these meetings, and committee members developed a better understanding of the problems of the foreman and the inspector. In addition, they learned more about the over-all products of the plant and the problems of other departments in the manufacture of parts for their department.

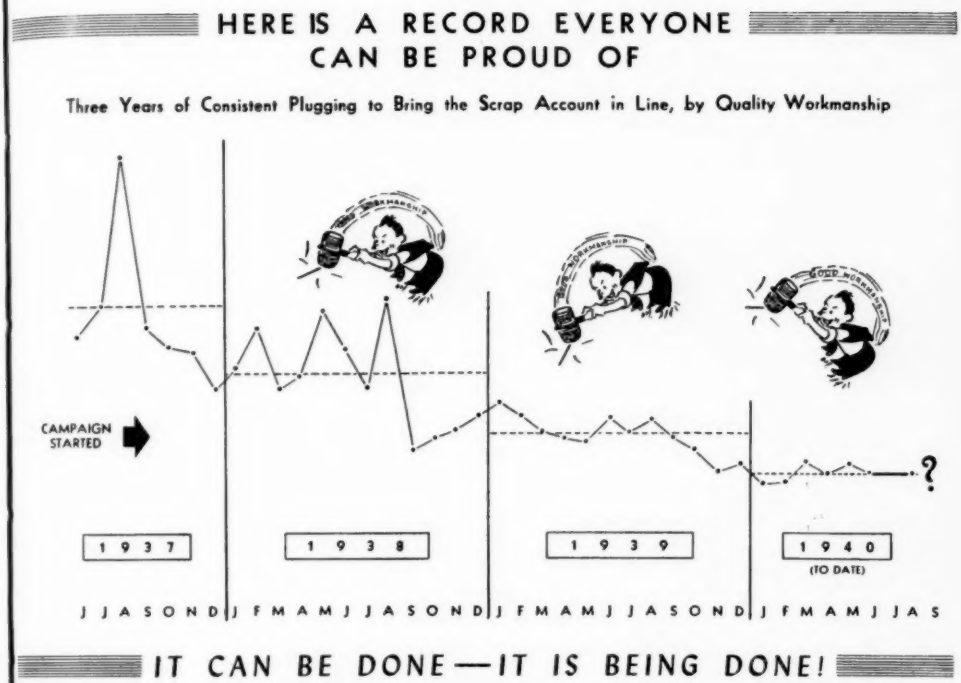

HERE IS A RECORD EVERYONE CAN BE PROUD OF
Three Years of Consistent Plugging to Bring the Scrap Account in Line, by Quality Workmanship
CAMPAIGN STARTED
?
1937
1938
1939
1940
(TO DATE)
J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S
IT CAN BE DONE—IT IS BEING DONE!

**FIGURE 3. The program record. Note decline in defective workmanship charges since start of campaign.**

The success of this program clearly proves that the problems of waste and defective workmanship can be handled cooperatively by committee organization, and more important still, that these problems can be effectively handled only by continuous cooperative work between all departments and individuals who contribute to the plant operations.

# SUPERVISORS CONDUCT ATTITUDE SURVEY

By J. J. EVANS, JR.
Personnel Manager
Armstrong Cork Company

**Armstrong Cork, one of the first companies to use the questionnaire as a means of soliciting employee opinions and suggestions, is once again pioneering in the field of attitude surveys. This time, Armstrong Cork employees are participating in an opinion poll planned and conducted by their supervisors. In this article, Mr. Evans tells how the supervisors constructed the questionnaire, what they wanted to know about employees' attitudes toward themselves, and how they thought the survey should be conducted.**

THE employee attitude survey is not a cure-all, but when properly used it has proved a very effective industrial relations tool. It is a useful means of supplementing management's and the supervisors' viewpoints on what employees think about their jobs. It is likewise helpful in obtaining opinions that employees would not state verbally. In short, it serves to indicate where attention is needed in the field of employee relations. The supervisors are the men directly responsible for employee relations, and they are therefore the logical ones to conduct an employee attitude survey.

Just as everyone can construe a letter from a friend much more accurately than could a total stranger, so the supervisor can best interpret the opinions and suggestions gathered through the survey, because he has daily contacts with those who wrote them. Moreover, he can put many of the ideas and suggestions received into immediate action.

This does not mean that others cannot make good use of the results in interpreting employee opinion of general policies and programs, nor that the over-all trend of opinion cannot be evaluated; it means that the supervisory group is the best agency for implementing the findings of the survey in day-to-day relationships.

The Training Section makes a practical clearinghouse through which the supervisors can plan and conduct such a survey. This is particularly true in an organization having plants widely scattered throughout the country, and in which the training function is definitely linked to the formulation and interpretation of policies. The conduct of an employee attitude survey is a problem that is clearly related to formulation and interpretation of company policies and therefore concerns the Training Section as well as the supervisory group.

We have a Plant Conference Program which acts as a constant two-way communication system between supervisors and management. This program is a practical attack on practical problems, and it provided an appropriate medium through which the survey procedure could be arranged.

It may be of interest to go over some of the highlights of an employee attitude survey planned and conducted by supervisors in conjunction with their Training Section. The survey had four main objectives:

1. To find out for each supervisor whether any of his employees were dissatisfied with any phase of their jobs, so that he could take steps to create improved opinion.

2. To disclose any situations that might lead to future misunderstandings if not corrected.

3. To determine employees' reactions to company policies and programs. This was intended more or less as a check-up, since this information had been secured three years earlier in the original survey.* It was recognized, however, that changing economic and social conditions might have affected employee opinions.

4. To get employees' opinions and suggestions as to how their jobs could be improved.

The supervisors were sure that these objectives could be achieved if two basic principles were observed. First, it would be necessary to obtain replies that were not only sincere but also definite; and, second, to assure that, after the survey, the company was prepared to take definite action on all factors upon which action appeared necessary. Needless to say, Management also subscribed to this opinion.

Early in the consideration of the project, it was decided that all debatable points would be discussed by each of the 23 conference groups, representing 17 plants. This would permit each plant to gather the opinions of its own supervisors for comparison with the views expressed by the supervisors in other plants. Separate surveys would be conducted in each plant and would be based upon the opinions of that plant's supervisors, with due regard to opinions of supervisors in other plants and to local conditions. Surveying on a plant basis rather than for the company as a whole would make it possible to localize opinions for analysis, without permitting identification of the individuals who expressed them.

### ESSENTIALS OF QUESTIONNAIRE PROCEDURE

It was recognized that certain facts must be considered in developing the essentials of the plan. For one thing, employees would not voice certain opinions unless they were confident that their views would be respected. The survey should be so conducted that there would be no possibility that a statement made by any employee would react to his disadvantage—and more important, the employee must *believe* this to be the case.

Another point to be considered was the fact that the average person

* See "Methods of Sounding Out Employee Attitudes," by J. J. Evans, Jr., in *Production Series Number 109*, American Management Association, 1938.

cannot always find words to express his feelings so they will be entirely clear to others. He may feel that something is not quite right, and yet be unable to "put his finger" on the exact cause of the difficulty. It was felt that this circumstance deserved particular consideration when the number and the type of questions to be employed in the questionnaire were being determined.

Furthermore, questions should be properly worded so that no possibility of misinterpretation would exist. Questions must be "neutral." They must be carefully stated so that they do not automatically call forth positive or negative answers, instead of ascertaining the employee's feeling on the point.

All efforts should be bent on securing answers as definite and as complete as possible. It is helpful to know that an employee feels a certain situation is wrong, but it is more important to know just why and how he thinks it should be corrected. This information will greatly facilitate the action to be taken after survey replies have been classified.

Another consideration of utmost importance is to insure a sufficient number of replies to give a true cross-section of the thinking of the entire group. There is a definite goal in this respect, and that is 100 per cent of those on the payroll. Lastly, replies must be sincere. Unless employees set forth their honest opinions and not what they think we want to hear, there is little use in making a survey. Everything must be done to create confidence and to convince employees that we are sincere in wanting to know the truth.

#### QUESTIONNAIRE TOPICS

Twenty-three conference groups, comprising 366 supervisors, discussed the problem in all of its major phases. Three major questions were considered: First, What topics should be covered by questions in the questionnaire? Second, What is the best method of getting questionnaires filled out? Third, How can the survey be explained to the employees?

It was agreed that concerning questionnaire topics the supervisors' function was to recommend the general intent of the questions rather than the exact wording, since the latter could better be determined by a smaller group. Over 270 questions were proposed for consideration. These questions were easily classified into the following groups: working conditions, company policies, hours of work, supervisors, safety, promotion, suggestions, general questions about the company, and a small miscellaneous group.

The supervisors wanted opinions as to whether or not physical working conditions were satisfactory, whether the proper equipment and tools were provided and whether materials permitted a quality job to be done. They also wanted to know, "If not, why not?" On company policies: "How

do employees feel about them?" As to pay: "Is it fair for the type of work done?" "Is it consistent with that paid for similar work in other departments?" "In other companies?" "How about the incentive system?" "Do you understand how your pay is figured?" As to hours of work: "Are they distributed without favoritism?" "Are you satisfied with shift rotation?"

The subject of "supervisors" was naturally the one in which the supervisors had the greatest interest. They apparently had no fear whatever of learning how their employees regarded them. Not a single conference group failed to propose several questions on this point, and more questions were proposed on this subject than on any other. "Is he fair?" "Does he make the work pleasant?" "Does he give instructions clearly?" "Do you feel free to discuss things with him?" "How is his personality?" and so on.

In the safety questions, the major intent appeared to be to find out if the job was made safe and if adequate measures had been taken. About promotion, supervisors wanted to know: "How do you regard your chances?" "Is the present system fair?" As to suggestions: "Are they given the proper consideration?" "What do you think of the system?" General questions about the company ranged from "What is your opinion of the company in comparison with other places where you have worked?" to "If you were president, what would you do?"

The complete questionnaire is reproduced in the Appendix at the end of this article.

The supervisors said that similar questions could be asked them, and that perhaps supplementary questions taking into consideration the broader aspect of supervisory responsibilities could be added.

## METHOD OF DISTRIBUTION

Five methods for distributing questionnaires to employees were proposed. Each was evaluated in terms of assuring the employee that his anonymity would be preserved and, with the intent of securing the greatest number of replies. More than half the supervisors favored distribution of questionnaires by the immediate supervisor, and this was the method finally adopted. Each foreman took an adequate supply of questionnaires into his department, asking each employee to accept one. The foreman had a large supply of the questionnaire forms and it was apparent to the employee that they were all alike, and could not carry any marks whereby his identity could be traced.

About one-fourth believed mailing the questionnaire to the employee's home was the logical method. The reasoning here was that it insures the questionnaire's reaching the home, but the possible disadvantage is that the employee may fear that his particular questionnaire can be in some way identified. The three remaining methods suggested were: distribution by

an employee or by a committee, distribution with pay-checks, and distribution by some method decided by the employees themselves for their own plant.

Employees did not fill out the questionnaires on the spot but took them home with them. The majority of all conference groups had favored this procedure since they believed that employees would feel less restraint in giving their actual opinions than if the replies were written on company time. Opinion heavily favored a method that would produce sincerity and completeness in replies at the possible sacrifice of a large number of returns.

#### METHOD OF RETURN

When it came to the matter of deciding how questionnaires should be returned, roughly one-third of the supervisors believed that they should be collected by an employee or employees selected for the purpose, but that a locked box should be used for collection. More than one-third of the supervisors felt, however, that locked boxes should be provided at the plant entrance or in the department, where employees could return their questionnaires; and a few groups favored provisions whereby returns could be made by mail. Practically all groups were of the opinion that the supervisors should not take a direct part in the collection of replies, but that they could help greatly in the way of encouraging employees to make their returns.

The method finally chosen provided for a sealed box into which employees dropped the completed questionnaires.

Since the supervisor is close to his employees, it was felt that he could do much toward the successful introduction of the survey to the members of his department. Personal contacts could be supplemented by bulletin board notices and through solicitation of the interest of employees' representatives.

#### SURVEY STARTED IN PILOT PLANT

After the opinions and recommendations of the supervisors had been collected on all these points, they were relayed to the local plant managements. This permitted further discussion of the techniques proposed by each plant in the light of recommendations made by the others. One plant was selected as a pilot plant to start the survey. A standard questionnaire compiled on the basis of recommendations made by supervisors, with variations to meet local needs, was adopted. The survey was conducted at the pilot plant, and all questionnaires were returned to the Training Section of the General Personnel Department for tabulation and classification. No supervisor saw any returned questionnaire. Instead, a tabulating card was punched for each one, making it possible to prepare a statistical report

quickly. In addition, all the comments and suggestions received were compiled in a separate section of the plant analysis. These reports were returned to the plant. Copies were also sent to the offices of the Production Manager and the Vice President in Charge of Manufacture.

This report has provided a project that will take supervisors many months to complete. It serves as a basis for many conferences on appropriate steps to be taken—among them, periodic reports to employees, who are naturally interested in knowing what is happening as a result of their answers. Furthermore, the supervisors are experiencing keen satisfaction in reporting progress to their Vice President, through their plant managements, on situations that have been analyzed and upon which appropriate action has been taken.

### PRELIMINARY RESULTS OF PROJECT

The experiences of the pilot plant were then reported to the next plants scheduled for survey and were applied by them in the final preparation of their plans. Preliminary results of the entire project are most gratifying. They have fully justified the approach taken—namely, that a logical way to conduct an employee attitude survey is through the supervisors in conjunction with their Training Section.

The percentage of returns have ranged from 60 to 100 per cent, with a general average, so far, of 73.5 per cent. Employees have written 15,693 comments on the 3,200 questionnaires returned to date, in addition to indicating by check mark their opinions on questions with multiple-choice answers. Their ideas, given in response to their supervisors and recorded on their own time, seem to have been presented with the utmost sincerity.

From the conduct of the survey up to the present juncture, we feel sure that an accurate appraisal of employees' corporate feelings has been provided by the employees themselves, and that employee relations will be further improved as a direct result.

## Appendix

### QUESTIONNAIRE USED IN EMPLOYEE ATTITUDE SURVEY

### WHAT'S YOUR OPINION?

We supervisors are sincere in our efforts to make your job one that you like. Perhaps we have been successful—perhaps not.

We are human. At times we are bound to make mistakes, but they won't be made purposely. If we fail to recognize them we must look to you, our associates, to set us straight in a friendly and constructive way.

Please give us your thoughts on the following things which are important to all of us. We don't want to know who you are, but we do want to know what you think. Type, print, or have someone else write in your answers—any way is satisfactory so long as we get *your opinions*. Under each question are several possible answers—check the one that best says what you think. Put your answer in your own words, if you would rather. If you don't have room for all your ideas, use the other side of the pages, put down the question number, and carry on.

## LET'S GO

### General Working Conditions

1. On the whole, do the equipment and tools with which you work permit you to do your job the way it is supposed to be done?
   1. Always ( ); 2. Almost Always ( ); 3. Sometimes ( ); 4. Seldom ( ); 5. Never ( ).
   I feel this way because.....
   .....
   I suggest .....
   .....

2. Generally speaking, do the materials with which you work permit you to do your job the way it is supposed to be done?
   1. Always ( ); 2. Almost Always ( ); 3. Sometimes ( ); 4. Seldom ( ); 5. Never ( ).
   I say so because.....
   .....
   I suggest .....
   .....

3. By and large, do you have the proper physical working conditions (as satisfactory light, heat, working space, ventilation, cleanliness, lockers, etc.) to make your job pleasant?
   1. Always ( ); 2. Almost Always ( ); 3. Sometimes ( ); 4. Seldom ( ); 5. Never ( ).
   I feel this way because.....
   .....
   I suggest .....
   .....

4. As a general rule, do you feel properly safeguarded from danger of accidents while at work?
   1. Always ( ); 2. Almost Always ( ); 3. Sometimes ( ); 4. Seldom ( ); 5. Never ( ).
   I think this way because.....
   .....
   I suggest .....
   .....

### Hours of Work and Pay

5. On the whole, are you given an equal number of hours of work in comparison with other employees in your department?
   1. Always More ( ); 2. Almost Always More ( ); 3. Given the Same ( ); 4. Most Always Less ( ); 5. Always Less ( ).
   I say so because.....
   .....
   I suggest .....
   .....

6. Do you understand how your pay is figured?
   1. Yes ( ); 2. No ( ).
   I suggest .....
   .....

7. Considering everything, how do you feel about the hourly earnings on your present job?
1. They Are Fair for the Job ( ); 2. They Are Not Enough ( ).
I say so because.....
.....
I suggest .....
.....

Security Programs

8. All things considered—cost to you, protection you receive, etc., do you think the Group Insurance Program is a "good thing"?
1. I Know It Is ( ); 2. I Think It Is ( ); 3. I Am Not Sure ( ); 4. No, It's Not ( ).
I think this way because.....
.....
I suggest .....
.....

9. Considering what the General Retirement Program provides for you, do you think it is a "good thing"?
1. I Know It Is ( ); 2. I Think It Is ( ); 3. I Am Not Sure ( ); 4. No, It's Not ( ).
I think so because.....
.....
I suggest .....
.....

10. Considering what the Income Security Program for 1940 provides for you, do you think it is a "good thing"?
1. I Know It Is ( ); 2. I Think It Is ( ); 3. I Am Not Sure ( ); 4. No, It's Not ( ).
I say so because.....
.....
I suggest .....
.....

Work Relationships

11. On the whole, do you get the proper instructions so that you know what to do?
1. Always ( ); 2. Almost Always ( ); 3. Sometimes ( ); 4. Seldom ( ); 5. Never ( ).
I feel this way because.....
.....
I suggest .....
.....

12. All in all, does your superior give you fair treatment?
1. Always ( ); 2. Almost Always ( ); 3. Sometimes ( ); 4. Seldom ( ); 5. Never ( ).
I say so because.....
.....
I suggest .....
.....

13. If you thought you were qualified for a better job that might open up, do you feel that you would be given fair consideration?
1. Yes ( ); 2. Probably ( ); 3. Doubtful ( ); 4. Would Get None ( ).
I say so because.....
.....
I suggest .....
.....

14. On the whole, are the opinions and suggestions which you make to your supervisors thoroughly considered by them?
1. Given Full Consideration ( ); 2. In Most Cases Considered ( ); 3. Listened To, But Nothing Done ( ); 4. Not Listened To ( ).
I think this way because.....
.....
I suggest .....
.....

15. If you were the supervisor of your department, what changes would you make?
.....
.....
.....
.....

In Conclusion

16. If we have failed to cover any points about which you want to comment, jot down your thoughts here:
.....
.....
.....
.....

17. Taking things all in all, I think the Armstrong Cork Company is
1. The Best Place to Work I Know ( ); 2. A Poor Place to Work ( ); 3. As Good as Most Places I've Heard of ( ).

18. I am a member of the group checked below:
1. Supervisors ( )
2. Office ( )
3. Production Department ( )
4. Shipping Department ( )

PLEASE DO NOT SIGN YOUR NAME

# THE TEXAS PLAN OF EXPERIENCE RATING

By F. B. CLIFFE
Assistant Comptroller
General Electric Company

**In the August issue of PERSONNEL an article appeared entitled "Notes on the Fiscal Aspects of the Cliffe Plan of Experience Rating," prepared by Mr. Appleman of the staff of the Social Security Board. Since its publication it has been felt that the article did not do impartial justice to the plan. Mr. Cliffe was therefore asked to prepare this statement from his point of view.***

THE state unemployment compensation laws by this time have assumed a generally accepted place in the pattern of American social economy. There has been successful mass education on the obligation of employers to contribute to the fund and the rights of individuals attached to the labor market to receive cash benefits when unemployed through no fault of their own. From the experience of the last several years, the benefit-paying portion of the unemployment compensation program is now operating throughout the country on a fairly routine basis. While much has yet to be done along the lines of simplifying the benefit formulas, extending coverage and lowering administrative costs, the essential groundwork has been laid.

It is now necessary to devote time and thought and energy to the larger purpose of unemployment compensation—the creation of incentives which will lead to stabilization of employment for the largest possible number of employees. Few will differ with the belief that jobs and wages are vastly more desirable and necessary than unemployment and benefit payments. To this end, the Social Security Act provided that state laws might include provisions (generally called "experience rating") which would grant employers a reduction in contribution rates in relation to the degree of employment stabilization achieved. Forty jurisdictions, recognizing the validity of this point of view, include in their laws one of several types of experience rating. In such states, employees are receiving the advantages of employers' efforts to stabilize employment; and already in several of those states many employers are paying lower contribution rates because of the successful stabilization of employment.

Within the last two years, a new type of experience rating has been developed which has engaged the attention of students of unemployment compensation. Interest in it has gained since its adoption by the states of Texas, Illinois, Delaware, Massachusetts, Virginia and Alabama.

* Mr. Cliffe prefers to call the method the Texas plan, in recognition of the first state to adopt it. It was originally designed by a committee of interested people working for better solutions to several of the problems of unemployment compensation. Improvements on the committee's original proposal for experience rating have resulted from suggestions by state administrators, organized labor, and employers throughout the country.

The following material describes the plan, as currently enacted in the laws of the six states, rather than dealing with the specific provisions adopted by Texas.

The plan includes conformity to the following principles which guided its authors in the original drafting.

(a) Offering each employer direct and continuous incentive, in the form of lower contributions, for regular employment of the largest possible proportion of his employees.

(b) Reasonable allocation, as between employers, of the cost of unemployment benefits. Statistical studies in states now operating under the Texas plan show that rate reductions are applicable to some employers in every type of industry and all sizes of firms, whether large or small.

(c) Requirement of a fund that is reasonably adequate to assure the payment of benefits under all probable conditions, without withdrawing from industry an unnecessary amount of funds.

(d) Maintenance of this fund by replenishing it over a period of years for the amount of withdrawals made.

(e) Meeting the foregoing objectives in a way that will have great administrative simplicity, and therefore very low cost to the state agency.

The Texas plan provides for charging each employer with the amount of wages paid by him during their respective base years to all of his employees or former employees who have subsequently claimed benefits and remained unemployed through the waiting period and first compensable week. This amount is usually called his "benefit wages" or "charged wages."

### CASUAL EMPLOYMENT

A comparison of the base year wages so charged against an employer with the amount of his taxable payroll indicates the irregularity of his employment. Obviously, a high percentage indicates that many or most of his employees have received benefits under the law. It should be noted that an employer can offer casual employment without subjecting himself to an excessive charge, because he has a charge that is related only to the amount of wages paid to such casual employees, rather than to the number thereof. Thus, an employer can hire 12 casual employees for one month each and the resulting charge, if they all claim benefits, will be no greater than that which would result if he laid off one employee of similar hourly rate who had worked for him throughout the base year. To first lay off the casual and unskilled workers has long been the usual procedure. Because it is better for the employer's rating and because employees prefer work and wages to benefit payments, an employer is able to spread his work as long as wages are maintained above the benefit level.

The charging of individual checks against the respective employers in "inverse chronological order," as required under some other types of experience rating, has presented difficult administrative problems to the states that have such a provision. The difficulty obviously increases if there is a large number of individuals who have each had numerous employers in the base year. To avoid this difficulty, the Texas plan assumes that each employer should be charged with the state's average duration of benefits, or, more accurately speaking, with that percentage of his benefit wages which equals the entire state's relation between total disbursements in the form of benefits and the state total benefit wages of all employees who have received such benefits.

This general assumption, which charges each employer with the state's average duration of benefits, is supported by the fact that the actual duration of benefits to any individual who has been laid off depends upon many factors not related to that employer. These include the current degree of industrial activity, the efficiency of the state employment service, the employee's own enterprise in seeking another job, etc.

The plan provides for a determination of the various percentages and resulting contribution rates from the experience of three years on each of the factors. This will lessen the degree of fluctuation from year to year in the contribution rate, and at the same time will prevent an excessive increase in the contribution rates in the first year following a downward turn of business activity. Thus, for the ordinary short business cycle, the contribution rate will reflect two years of rising business activity and one year of decline. Only if we have a long-continued recession will the contribution rates reflect exclusively adverse conditions.

### "SAFETY FACTOR"

The original Texas plan has been modified in the laws adopted by Illinois, Massachusetts, Virginia and Alabama. They contain what has been referred to as a "safety factor," that is, a special increase in the contribution rates if the fund falls below a predetermined point, and usually a corresponding special decrease in the contribution rates if the fund exceeds another and higher specified point. This provision seems desirable because contribution rates have had no relation to benefit disbursements for the first five years that the laws have operated in each state. It is also recognized that even thereafter the contribution rates provided in the Texas plan may not exactly replenish the fund. If there is a long trend or bias of the fund upward or downward, it will be corrected by this so-called safety factor, so that the fund will be kept within the predetermined limits.

It must be recognized that there are many modifications of the foregoing principles that states may reasonably make without destroying the

major principles involved or the operating simplicity and low cost of administration inherent in the Texas plan:

(a) Each state has the right to determine the minimum and maximum contribution rates charged. Generally speaking, these limits may be lower in a state in which unemployment is a relatively small burden. Thus, states which are characterized by a high degree of diversity of employment and states whose major industries are relatively stable can properly use lower limits than states in which the opposite conditions exist.

(b) States have used different bases for the determination of their normal fund and the reasonable variation above and below such normal, within which limits the "safety factor" will not be called upon. There is considerable justification for relating these limits to the state's actual experience in the payment of benefits, such as using a specified number of times the actual benefit payments in the year of largest disbursements.

(c) There is justification for providing that no employer shall be charged with benefit wages for any one of his employees in excess of the amount that would furnish that employee with the maximum amount of benefits. The exact amount will vary from state to state with the benefit formula currently used. The object of this limitation is to prevent excessive charges against employers whose wage scales are higher than those required to yield the maximum benefit. The principle is, of course, comparable to limiting the taxable payroll to the "first $3,000."

(d) The variations in contribution rates apply only to employers who have been subject to the law for three or more years. There will thus always be a substantial number of new employers paying the normal 2.7 per cent contribution rate.

The operating simplicity of the Texas plan is clearly evident from a consideration of the actual procedures. These will, of necessity, vary somewhat with the benefit formula in a particular state, as well as with the type of equipment used by the state agency in processing its claims. Therefore, the following statements are illustrative and subject to modification in each state.

#### HANDLING OF CLAIMS

When a claimant first applies for benefits, the agency must of necessity consult his wage history as reported by his various employers during the base period. Having determined that he is eligible for benefits, and having fixed his weekly benefit rate from such records, the first step taken under the experience rating provisions is a simple refiling of such records, after the first benefit check has been issued, according to the employer who paid the wages during the base period. As a part of such refiling, the employer may be notified immediately or periodically of the benefit wages that are

being charged against his account, resulting from the claim of "employee ....., Social Security Account No. ....., base period wages ....." At the end of each year, the total amount of benefit wage records filed under the number of each employer (or a summary of the periodic reports rendered to the employer) will be determined. This total, plus the corresponding figures for the preceding two years, will be divided by the employer's total taxable payroll for the same three years, in order to determine the "employer's experience factor."

A comparison of the total amount of benefits paid in the state during the three-year period is made with the grand total of all benefit wage charges in the state against all employers for the three years. This determines the "state experience factor."

The law contains a table which gives, for the state experience factor that may be determined for a given year, the maximum percentage which an employer may have as his own experience to be eligible for each of the specified contribution rates.

The formula may be expressed as follows:

$$\frac{\text{Total benefit wages charged Employer A}}{\text{Employer A's taxable payroll}} \times \frac{\text{State total benefits paid}}{\text{State total benefit wages}} = \text{Employer A's contribution rate.}$$

In the construction of this table, all fractions have been rounded up against the employer. Thus, if the formula indicates a contribution rate of 1.3 per cent, the table calls for the employer to pay 1.5 per cent. Thus, all employers, except those whose own experience requires them to pay the maximum state rate, are paying the cost of benefits to their own employees plus a contribution to the general fund. These contributions offset, approximately, the losses to the fund by reason of the remaining employers whose payment at even the maximum rate is less than the benefits received by their employees. This wide distribution of part of the cost of the least stable employers corresponds to the contributions to a "partial pool" or "balancing account" which are required in all of the employer-reserve laws. It will be noted that the table can be constructed for any desired interval of contribution rates and for any desired minimum and maximum rates. The states which have so far adopted the formula have seen fit to vary their contribution rates in steps of .5 per cent, but this is not essential.

After the state administration has determined the employer's experience factor and consulted the table in the law to read his required contribution rate, the only additional step is to notify the employer of that rate. This might well be done by inserting the rate on the blank contribution form which the agency sends to the employer for the first contribution period in the new year. It would be common practice to insert this contribution rate

by means of adding it to the employer's addressograph plate which would be used throughout the year.

**ADMINISTRATIVE EXPENSE**

While the administrative expense of handling experience rating has been demonstrated to be exceedingly low ($12,000 a year for 17,000 covered employers and more than 900,000 covered employees in Texas), some states with a coverage of firms having less than eight employees have feared that there would be an excessive increase in cost with the large number of small employers subject to the law. A consideration of the procedure indicates that these fears are not well founded, because there is no analysis needed for employers who do not have any employees claiming benefits. Obviously, an employer with four employees would have no charges unless his labor turnover was at least 25 per cent, and even with that rate of turnover there would be no charge unless the one separated employee claimed benefits within approximately a year after leaving such employer's service.

The subject of experience rating is of vital importance to thousands of employers who naturally desire to pay contributions that are limited to the amounts needed for benefits (after the creation of a proper reserve), and is of equal importance to millions of employees who desire to have their employers encouraged to furnish wages with the maximum possible degree of regularity.

It is frankly recognized that the Texas plan is not absolutely perfect either in its theory or in its application. It fails to meet some of the standards that are suggested by the opponents of all experience rating, who would demand that experience rating must be more nearly perfect than the unemployment compensation law of which it is only a section. As an example of unfounded charges against the Texas plan, it is often stated that an employer is penalized for hiring an employee. This completely disregards the fact that the contributions under the Social Security Act are levied upon payroll, and thereby a burden is imposed upon an increase in payroll. This burden is removed with experience rating if the employer hires *and keeps* the employee. It is believed that these critics and criticisms may properly be disregarded since the plan meets the major objectives assigned to it, and does so at an administrative cost that approximates 1/100 of the amount which is being expended as administrative expense by the state employment security agency for its other functions.

# TRAINING PROGRAM OF DEFENSE ADVISORY COMMISSION

*The following bulletins of the Labor Division of the Advisory Commission to the Council of National Defense will serve to bring readers of* PERSONNEL *up to date on the steps that are being taken to answer industry's increasing need for capable workers and supervisors. These bulletins were originally issued on September 24 and re-issued in revised form on October 21-22. They were prepared by Channing R. Dooley, Manager of Industrial Relations, Socony-Vacuum Oil Company, who is serving as Director of Training Within Industry. Mr. Dooley formerly was Vice President of the AMA Personnel Division.*

## The "Training Within Industry" Program

Based upon types of requests for assistance which have been received from industry, the problem of increasing all kinds of skill as needed divides itself into three parts:

1. ***Inventory of present skills.*** This should cover unemployed, employed and employed below their greatest usefulness. Various responsible federal, local and cooperating agencies are already at work gathering this information, but also each plant should take stock of the talent and experience of its employees and make internal adjustments before employing new men.

2. ***Training outside of industry.*** This includes pre-employment preparation and supplementary related, out-of-work-time instruction. This part of the program is already being provided for by public and private vocational and trade schools and by engineering colleges, but it is of such vital interest to industry, that the closest kind of cooperation must be continuously maintained with them. National Youth Administration, Work Projects Administration, and Civilian Conservation Corps also offer opportunities for pre-employment work experience.

It is of utmost importance that the industries served participate actively with the schools in setting up entrance standards, so that all who complete the course will be acceptable for employment. It is also important that the numbers of persons trained be not greatly in excess of the needs of the industries served. Industry can well afford to supply some of its first class employees to schools as teachers. Some of their retired employees would be excellent instructors. Industrial management can also assist these other agencies in making their services increasingly useful to industry.

3. ***Training within industry.*** This particularly deals with industry's own training responsibilities, and is the area in which the efforts of this activity will be concentrated.

The conclusions of various recent conferences confirm experience that this training includes three phases:

(a) Development of *production workers* through intensive instruction and planned job progression bases upon analysis and definition of jobs according to basic operations.

(b) The establishment of *trades apprenticeship,* in accordance with federal standards, separate from production worker training, for the purpose of developing a predetermined, limited number of all-round journeymen mechanics.

(c) The development of supervisors through careful selection, assignment of supervisory duties of increasing responsibility, and provision for related organized help through discussions and conferences under both plant and outside auspices. Technical and other management assistants must be developed also.

It is the intention of this organization to render specific advisory assistance to defense industries in inaugurating programs which they will carry on within their own plants at their own expense. The availability of this service will be made known, but it will not be compulsory. There will be no authority to go into a plant on any basis other than at their request.

Four general types of assistance will apply in most cases and will be adapted to fit the various conditions in each specific plant.

1. Help in the analysis of the training needs.

2. Aid in setting up a program within the plant to meet its needs.

3. Make available the experience of other employers who have met similar problems through headquarters and field clearance.

4. Acquaint plant management with the availability of the services of tax-supported government agencies, such as the state and federal employment service, vocational and trade schools, engineering colleges, N.Y.A., C.C.C., W.P.A., so that the fullest use may be made of them. Only through the closest coordination and interpretation of the needs of industry to these agencies can they furnish the most effective pre-employment education and experience, as well as related instruction for employed workers.

This field service can be most effectively rendered by representatives of "Training Within Industry" working continuously in local areas of the district in which defense industries are located. Their activities will be carried on under the general direction of a small staff at Washington headquarters, so that the experience in each district will make a contribution to the program as a whole.

The field organization will be set up in some 22 Districts as follows, according to the most important industrial centers. Field experience may result in a smaller or larger number of districts.

| | |
|---|---|
| New England | Northern Ohio |
| So. New England (Conn. & R. I.) | Michigan |
| Upstate New York | Indiana |
| Greater New York City | Greater Chicago and Illinois |
| New Jersey | North Central States |
| Eastern Pa. and Delaware | Mo., Ark., Okla. and Kansas |

| | |
|---|---|
| Maryland | Texas & Louisiana |
| Virginia, N. & S. Carolina | Colorado & Wyoming |
| South Eastern States | S. Calif., Ariz., N. Mexico |
| Ohio Valley | N. Calif., Nev. & Utah |
| Western Pa. & N. West Virginia | Pacific Northwest |

In each district the organization will be about as follows:

1. One District Representative borrowed from industry because of his experience and standing in this field of work.

2. One Field Assistant.

3. One Office Assistant.

4. A panel of ten or more personnel and training Consultants borrowed from industry on account of their knowledge and experience, to be available on call as needed.

All field staff will receive "per diem" expense and travel payment while serving the Defense Commission away from their home stations.

5. Four Advisers, two from labor and two from management, will be selected on account of their background and experience in dealing with such problems within manufacturing industries. They will assist the district representative in anticipating and meeting training problems in their areas, and also will be helpful in creating and maintaining public interest.

## Upgrading Within Industry

The following represents the considered judgment of many representatives of industrial plants who have cooperated in the preparation of this statement of basic practice which prevails in their companies.

### PROMOTION FROM WITHIN

Modern industrial organizations are made up basically of three kinds of employees: (1) A large number of *production workers* who perform one or a few operations skilfully and hence are able to achieve high production in a minimum time; (2) A smaller group of all-round *skilled tradesmen* or craftsmen; (3) *Supervisory,* managerial and technical employees and their clerical and office assistants.

The factory is a collection of coordinated processes. In the large, it is itself a machine. Jobs are not static—they are lines of flow through the shop. One job leads to a better and more important one and the employee gets his training and develops his skills step by step. A man's job is a rung on the ladder of promotion and progress. This is the efficient way as well as the American way. It is a system that leads workers from the bottom upward in the pyramid of organization. Rapid and efficient training can be made to

meet unusual expansion needs through such a definite step-by-step program.

There are four things to do in setting up such a plan:

1. ***Engineer the job structure.*** Carefully analyze jobs into their basic operations as far as possible. Grade and establish their relative worth. Set workers as much as possible to performing single operations, thereby achieving efficiency, high production, good wages, and preparedness for the next step.

2. ***Map the naturally effective lines of promotion.*** When the job structure is examined, it will be apparent that there are natural channels through which the worker may be upgraded. The bench worker may be moved to a simple machine operation, then to more exacting operations, next to work requiring him to perform his own setup, and so on upward. Such natural training paths of movement can be mapped out.

3. ***Select qualified employees for upgrading.*** When better jobs are open, they should be filled by the best qualified employees. An inventory of the working force will classify the employee's potential ability, previous experience, education, his job preference, and length of service. No matter what form this inventory takes—whether through interviews or personnel records, or any other means—such information is essential to training through upgrading.

4. ***Adopt an upgrading policy and make some one individual responsible for making it effective.*** It is essential that top management establish a definite policy of promotion from within in order to train effectively through upgrading. Under this plan one individual is responsible for all placements. He should know as much as possible about the jobs in the plant and about the employees' qualifications to fill them. In addition, employees should be permitted to apply for changes in their jobs without prejudice.

Such a centrally controlled plan makes available for quick reference, information on worker analysis, job analysis, and paths of upgrading. Such a transfer service collaborates with the line supervision in filling higher jobs with the objective of giving the better job to the best qualified employee. Those who operate this central service must have authority from higher management so that they will be consulted on all upgrading opportunities and be in agreement regarding the final action to be taken. Any disagreement between the line organization and the central service moves up the line for review and final decision by top management. Such a plan can quickly be set up by assigning the responsibility to a man of wide knowledge of jobs and workers in the plant. As it operates, it will build up records and experience which will enable it to do an increasingly better job.

Carrying out such a policy of training through upgrading, coordinated by a central placement service results in rapidly and efficiently training a working force of greater flexibility and effectiveness.

Pay adjustments should be made simultaneously with promotion to the jobs of higher rating. Prompt recognition in compensation and status are the means for stimulating and maintaining interest in the learning process. There will be high morale because of this policy of advancement, based on the fair and unprejudiced consideration of merit. Where merit and other factors are equal, preference should be given to length of service.

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## ALIEN REGISTRATION

The period for the registration of non-citizens under the Alien Registration Act ends on December 26. The Act does not impose any obligation on employers to see that their non-citizen employees are registered. However, many companies voluntarily are assisting such employees to perform their duty under the Act.

The Director of Registration suggests that companies that wish to be helpful can discuss the subject in their house organs and place notices on their bulletin boards. He suggests posting the actual registration blank. The Personnel Department could offer to assist any employee to fill in his form.

Employees who are uncertain as to their citizenship should be advised to consult the official regulations available at all post offices. If any real doubt persists, the person should be advised to register.

Where the number of employees involved is large, employers could make special arrangements with post masters for after-office-hour registration.

Some employees may be loathe to have their fingerprints taken, but they should be assured that fingerprinting is simply a modern method of identification.

Employees ought to be reminded, also, that after registration, it is their responsibility to report to the authorities their change of address.

# Recent Books of Interest to Personnel Executives

DISMISSAL COMPENSATION. By Everett D. Hawkins. Princeton University Press, Princeton, N. J., 1940. 390 pages. $4.00. Hardly more than a decade ago there was virtually no literature existing on the subject of dismissal compensation. The practice had not reached sufficient importance in management to warrant published discussions of it. We now have for the first time an entire book devoted to dismissal compensation. The author, Mr. Hawkins, began collecting his material in 1930 and his volume represents the fruit of intensive research in this country and abroad. His book is comprehensive and the data exceptionally well-organized. In it the executive and student will find the background and philosophy of dismissal compensation, as well as its present extent and character. The first part of the book is based on material gathered from more than 120 American corporations and deals with company experience in the United States. The latter part describes American trade union plans, voluntary plans abroad and compulsory trade legislation. A final chapter summarizes and compares various types of experience and relates the problem of dismissal compensation to technological unemployment. Of special interest is the section on the value of a dismissal compensation program when employment decreases after a wartime peak.

STABILIZING JOBS AND WAGES. By Herman Feldman. Harper & Brothers, New York, 1940. 334 pages. $3.50. One of the great significant developments in modern management in recent years has been the progress in the field of employment and wage stabilization. Even though at first this work was limited to a few pioneer companies there is abundant evidence to show that industry in general has begun to understand the importance of stabilizing jobs and wages. Many concerns that thought their business was hopelessly seasonal have found that by the addition of new product lines or changes in the method of operation, they could do much to level their year-to-year volume and thus provide steady employment to their workers. Herman Feldman, Dean of the School of Business and Civic Administration, College of the City of New York, and former Professor of Industrial Relations at the Amos Tuck School, Dartmouth College, in writing this book has done much to further this program. With most of the states in the union about to introduce merit rating under their unemployment insurance laws, interest in regularization among employers is rapidly increasing. Companies that have investigated the stabilization problem have found that it was good business to stabilize operations, and, now that there will be a penalty for employee turnover, this goes double. The movement is now being propelled under the impetus of both motives of operating economy and humanitarian concern. Dean Feldman has been a keen student of methods of employment stabilization. In 1925 he published "The Regularization of Employment." This present book represents a re-writing of that earlier analysis in the light of recent progress.

THE PRODUCTIVITY OF LABOR IN THE RUBBER TIRE MANUFACTURING INDUSTRY. By John Dean Gaffey. Columbia University Press, New York, 1940. 204 pages. $2.50. Productivity in individual industry and industrial progress are both fruitfully studied in this examination of the technological and economic history of the rubber tire manufacturing industry. Emphasis has been placed upon the environmental factors which favor industrial progress, and attention has been focused upon the incidence of productivity gains. The book will be of value to the rubber tire industry, to all concerned with labor problems and industrial relations, and finally to those seeking an example of the conditions and circumstances that have contributed to one important aspect of twentieth-century industrial development.

UNEMPLOYMENT AND THE UNEMPLOYED. By H. W. Singer. Chemical Publishing Co., Inc., New York, 1940. 152 pages. $2.75. This is a British view of the unemployment problem. The book was written before the outbreak of the present war, which, although it eclipses the unemployment problem to a certain degree, at the same time threatens to aggravate the situation after peace is declared. Although written in non-technical language, the book considers the subject of unemployment from the economist's point of view. While the basic considerations in the British unemployment problem are the same as those involved in the problem in the United States, certain differences exist that make many of the author's suggestions inapplicable in this country.

PROFITABLE IDEAS FOR MANAGEMENT OF PERSONNEL. By E. N. Hay. Section of "Business Ideas for Increasing Profits." Prentice-Hall, Inc., New York, 1940. Entire Service, $25 per year. This section of the Prentice-Hall Business Ideas Service considers the essential operations in the management of a personnel department. The author, who is an experienced personnel executive, analyzes personnel methods in the light of the best known practices. The report considers the workings of the personnel department step by step, from the employment of a new worker to the establishment of his security and welfare. Both concerns that already possess large, well-established personnel departments and those who are only now developing this phase of management will find many useful ideas in this analysis. An executive possessed with an inquiring and exploratory mind, Mr. Hay has compressed into a relatively short space the best that is known concerning the management of the human factor in business. Readers will find of special value the part dealing with employee selection and rating.

MODERN FOREMANSHIP AND SUPERVISION UNDER NEW DEAL LEGISLATION. By Harvey B. Rector and W. A. Rinckhoff. Law Research Service, Cincinnati, 1940. 156 pages. $1.50. One can hardly expect the foreman or supervisor to know all the fine points of the tangled New Deal labor laws. However, in most plants men in supervisory positions must have at least some elementary understanding of them. This book is designed to provide supervisors with a grasp of the essentials and the significance of the National Labor Relations Act, the Fair Labor Standards Act and the Walsh-Healey Act. More than this, the book is calculated to provide foremen with a "working knowledge" of this legislation so that they can know an unfair practice readily. A unique feature of this little book is its charts of the labor laws that provide a check list of illegal practices.

INDUSTRIAL MANAGEMENT. By Richard M. Lansburgh and William R. Spriegel. John Wiley & Sons, Inc., New York, 1940. 666 pages. $4.50. This is a third edition of a well-known text on management. It is essentially a book for the beginner and makes no new contribution to the literature in the field of management. Most of the new material that the edition contains has already appeared in some form in business publications.

BUSINESS ORGANIZATION. A Report by the Policyholders Service Bureau, Group Insurance Division, Metropolitan Life Insurance Company, New York, 1940. 52 pages and charts. Gratis. This report provides information on certain general principles and patterns of organization structure which can be applied to individual circumstances. A major part is devoted to a description of the organization plans of 20 representative companies as case studies under the broad industrial classifications of railroads, public utilities, manufacturers and retail establishments. Reproductions of the organiza-

tion charts of seven companies are included. Among the points discussed are basic types of organization, the subdivision of authority into administrative groups, the factor of span of control and the question of centralization or decentralization. It also considers the committee, both as a policymaking and as an administrative device, and the place of organization charts and manuals in the general picture.

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STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACTS OF CONGRESS OF AUGUST 24, 1912, AND MARCH 3, 1933,

Of PERSONNEL, published quarterly at New York, N. Y., for October 1, 1940.

State of New York )
County of New York ) ss.

Before me, a Notary Public in and for the State and county aforesaid, personally appeared James O. Rice, who, having been duly sworn according to law, deposes and says that he is the Editor of PERSONNEL and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912 as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, American Management Association, 330 West 42nd Street, New York, N. Y.; Editor, James O. Rice, 330 West 42nd Street, New York, N. Y.; Managing Editor, None; Business Manager, Alvin E. Dodd, 330 West 42nd Street, New York, N. Y.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given). American Management Association, 330 West 42nd Street, New York, N. Y.; Alvin E. Dodd, President, 330 West 42nd Street, New York, N. Y.; James L. Madden, Treasurer, 1 Madison Avenue, New York, N. Y.

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JAMES O. RICE, Editor

Sworn to and subscribed before me this 23rd day of September, 1940.

(Seal)

RUTH KHAN, Notary Public.
(My commission expires March 30, 1942.)